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KINDERGARTEN CHILDREN'S UNDERSTANDING OF
PREPOSITIONS OF SPATIAL POSITION

by



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A THESIS

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "Kindergarten Children's Understanding of Prepositions of Spatial Position" submitted by Edna Myrtle McLeod in partial fulfilment of the requirements for the degree of Master of Education.



ABSTRACT

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This study investigated kindergarten children's understanding of twenty prepositions of spatial position. In order to examine the subjects' comprehension of spatial prepositions, three modes of response were utilized. These modes included the following:

1. Non-Verbal response: a response given by the subject by placing an object in the spatial position at the verbal request of the examiner.
2. Controlled-Verbal response: the 'yes' or 'no' response given by the subject, to a question directed to him verbally, and the explanation given for the positive or negative response.
3. Free-Verbal response: the verbal language a subject used to describe the spatial position of an object.

In addition, the nature and extent of the relationships between the variables age, sex, socio-economic status and modes of response were investigated.

The sample of sixty was selected on a random basis from eight kindergarten classrooms in the city of Regina, and stratified to include equal numbers of subjects in each age, sex and socio-economic group. The test was administered individually to subjects with half of the population receiving the Non-Verbal and Controlled-Verbal response sections first and the remaining subjects receiving the Free-Verbal response section first.

Children's mean scores on the Non-Verbal and Controlled-Verbal sections were analyzed using a two and three-way analysis of variance

and a "t" test for differences between means. Free-Verbal response scores were analyzed in a non-statistical manner by the researcher.

In general, the results indicated that children were able to achieve higher scores on the Non-Verbal response section and lower scores on the Free-Verbal response section. Thus, it seems that children have gained some understanding of prepositions of spatial position, but do not as yet use them in their speech.

Younger subjects tended to score above their older counterparts on the Controlled-Verbal and Free-Verbal response tasks. Thus, the older children appear to be experimenting with the verbal labels for the concepts of spatial position. Males scored below females and children from the high socio-economic strata achieved superior scores to children of the low socio-economic strata. Although only a small portion of the sample was utilized for testing the variable of intelligence, high intelligence appeared to be an indicator of success on test scores.

The study indicated that children were able to understand prepositions of spatial position when they occurred in context. The findings suggest that educators must beware of assuming that children fully understand the concepts underlying the verbal label, and provide opportunities for learning such spatial concepts in a variety of situations.

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CHAPTER I

I. INTRODUCTION

The purpose of this study is to determine whether kindergarten children understand prepositions of spatial position. In order to comprehend these terms, the child requires a basic concept of spatial position and the ability to determine the meaning of spatial prepositions according to the context in which they are used.

Language and concept development proceed simultaneously and it is through the acquisition of language that the child is able to symbolize, recall, organize and communicate his ideas.

The study involves an attempt to discover whether the mode of response influences the child's ability to understand and to use terms of spatial position.

II. BACKGROUND

A child's perception of spatial position has been described by Frostig (1966:10) as the ability to perceive the position of two or more objects in relation to himself and to each other. The child learns to perceive the world around him through his physical activity and the manipulation of his environment. At the same time, his growing perception is influenced by, and influences, his linguistic development.

Piaget (1963) says that a child's initial perception of spatial position depends upon his kinesthetic and sensori-motor experiences. With the development of language the child is further able to differentiate his perceptions and classify and organize his concepts.

"In the early stages of child development, speech is only a means of communication with adults and other children--subsequently it becomes a means whereby he organizes his experiences and regulates his own actions. So, the child's activity is mediated through words," (Luria, 1957: 236).

Initial concepts that a child acquires are based on concrete experiences. Concepts dealing with objects and their relationships are the first concepts acquired and provide the basis upon which more complex concepts are built. As these concepts are visualized and internalized, the relationship between the concept and its symbolic language form is clarified. "Concepts are symbolized and verbalized by the individual; and the symbols or words in themselves become new concepts," (Serra, 1953:10)

Concept development thus depends upon perceptual, cognitive, emotional and motivational experiences. Reissman (Olsen, 1965) postulates that children who lack experience appear 'word locked' when they are really 'concept locked'.

Words have meaning only when associated with thought. The young child perceives words as concrete ideas. Watts (1953) noted that in so far as general and abstract terms are employed by young children they are used at first almost entirely with specific reference to a particular situation. He found that children under the age of five were seldom able to use terms of spatial position and concluded that they were learned as a result of maturation and experience. Other researchers (Dunkel, 1944, Dolch, 1927, and Richards, 1953) found that words which caused the most difficulty for children were those which acted as symbols for abstractions and generalizations.

Words which act as symbols for abstractions and generalizations are needed in order to organize and systematize our experiences. Warren (1933) states that words such as 'round', 'square', 'over', 'above', or their equivalents are necessary in order to understand and interpret even the commonest of our perceptions. Language thus facilitates the ordering, sequencing and coding of our experiences.

According to Piaget (1928) the very essence of the cognitive development of children is the socialization of thought which occurs within the child's environment. The structure of the family and the social situation shape communication and language. The language shapes thought and cognitive styles of problem solving.

Ponder (1965) noted that children from low socio-economic groups are hampered because of their low self-image and motivation. Bernstein (1965) postulates that these children are hindered in their language development because of little verbal interaction or reinforcement for verbal communication within the home.

"When a child is sensitive to an elaborated code the school experience for such a child is one of symbolic and social development; for the child limited to a restricted code the school experience is one of symbolic and social change," (Bernstein, 1965:165).

In a study carried out by Sigel (1964) to determine the effect of pictures and words on children's responses, he found that there was no significant difference in a sorting task; concepts employed for categorization were tied to the meaning of the objects rather than the stimuli of color, texture or size. In a similar study carried out by Otto (1962) he found that verbal stimuli evoked more responses than did pictures and that the nature of responses to certain stimuli groups differed signifi-

cantly (with undergraduate students) by mode of presentation. Everett (1968) found that concrete objects evoked superior conceptual understanding in young children than did pictorial materials. Thus, it would seem that the mode of response and mode of presentation have an effect on children's conceptual and language development.

Language development and cognitive development proceed simultaneously. The experiences a child undergoes and the language models to which he is exposed profoundly affect his linguistic ability. It is the purpose of this study to investigate the factors which might influence the acquisition of prepositions of spatial position and the effect that the mode of response has upon the child's comprehension of the terms being tested.

III. DEFINITIONS OF TERMS

Throughout the study, the terms were defined as follows:

Prepositions of Spatial Position. Prepositions which define the position of an object in space.

Mode of Response. The manner in which the prepositions of spatial position were indicated by the subject. Three modes of response were used; Non-Verbal, Controlled-Verbal and Free-Verbal.

Non-Verbal Response. A response given by the subject by placing an object in the spatial position at the verbal request of the examiner.

Controlled-Verbal Response. The 'yes' or 'no' response given by the subject, to a question directed to him verbally, and the explanation given for the positive or negative response.

Free-Verbal Response. The verbal language a subject uses to

describe the spatial position of an object.

Socio-economic Status (SES). The position that an individual holds in relation to other members of the community as measured by scores obtained on the Blischen Occupational Scale and the revised Elley Gough Home Index.

(a) High socio-economic status (HSES) refers to subjects whose scores were above sixty on the above measures.

(b) Low socio-economic status (LSES) refers to subjects whose scores were below forty on the above measures.

Age Groups. All subjects whose ages fall within the period designated.

(a) Age group I - subjects ranging in age from five years eight months to six years two months.

(b) Age group II - subjects ranging in age from six years three months to six years nine months.

IV. HYPOTHESES

The study was undertaken in order to determine if kindergarten children understand prepositions of spatial position under varying response conditions when age, sex, socio-economic status and intelligence were considered.

The following null hypotheses were posed:

- I. There is no significant difference in children's scores between the Non-Verbal, Controlled-Verbal and the Free-Verbal Response.
- II. 1. There is no significant main effect for age, sex, socio-economic status and mode of response.

2. There is no significant two-way interaction for:

- (a) age and mode of response
- (b) sex and mode of response
- (c) socio-economic status and mode of response
- (d) sex and age
- (e) socio-economic status and sex

3. There is no significant three-way interaction for:

- (a) sex, socio-economic status and mode of response
- (b) age, sex and mode of response

V. DESIGN OF STUDY

Sixty children were selected on a random basis from eight kindergarten classrooms in the city of Regina. The sample population was stratified according to age, sex, and socio-economic status. There were equal numbers of males and females from each socio-economic status, as measured by the revised Elley Gough Home Index Scale (1961) and the Blischen Occupational Scale (1967). They were further stratified by further random selection to ensure equal numbers of subjects for each age group.

The test was administered by the researcher in two sessions. Half of the children received the Non-Verbal and Controlled-Verbal response sections during the first testing session. The remaining half of the sample received the Free-Verbal response section of the test during the initial testing session. A time lapse of two weeks occurred between subjects being tested on the alternate mode of response.

Scores were recorded as responses were given for the Non-Verbal

and Controlled-Verbal response sections of the test. Subjects' responses on the Free-Verbal mode of response were recorded on a tape recorder, transcribed and typed before being scored by the researcher.

Subjects' scores were punched onto IBM cards and programmed by the computer center at the University of Alberta. The scores were subjected to three-way analysis, two-way analysis and correlated t-score statistical measurement.

VI. LIMITATIONS

The findings of this study are limited in the following ways:

1. The population was restricted to sixty subjects due to the time involved in individual testing. Therefore, it cannot be assumed to represent the total population of kindergarten children.

2. The design of the study required that children who were presently attending kindergarten and ranged in age from five years eight months to six years nine months only be used in the sample population. Therefore, it is recognized that the results of the study cannot be generalized to all pre-school children.

3. The test used in this study to measure children's understanding of prepositions of spatial position is being utilized for the first time. Although there is some basis for the validity and reliability of the test, it must be recognized that the results are based on a limited sample.

4. The scoring procedures used in this study were developed by the researcher. Since these procedures have not been validated, there is no guarantee that comparable findings would result had other scoring procedures been utilized.

VII. SIGNIFICANCE OF THE STUDY

If the study shows that there is a significant difference between children's scores on the three modes of response considered, the necessity for modifying teaching methods with kindergarten children will be underlined. It will demonstrate that children are better able to comprehend when a particular mode of response is used and thus show teachers how to adapt methodology to suit a particular mode. For example, to encourage children to use the prepositions of spatial position in their speech to describe the position of objects or require children to explain or demonstrate spatial positions given in a verbal direction rather than a purely non-verbal response.

Should the results point to children's understanding of prepositions of spatial position through the Non-Verbal mode of response as superior to the Controlled and Free-Verbal response, educators will be alerted to the necessity of increasing the child's verbal ability to use these prepositions.

A description of the prepositions which the children understand will assist educators in determining those prepositions of spatial position which kindergarten children appear to have acquired. This knowledge will assist in developing the conceptual and language abilities that the children require. It may also be of benefit to the teacher of reading in determining whether the child understands the prepositions he meets on the printed page.

The researcher hopes that the study will provide additional information to the area of children's language development.

If age, sex and socio-economic status are shown as influencing factors in the acquisition of prepositions of spatial position, it should re-emphasize the necessity for adapting programs of instruction to meet the needs of the pupils.

VIII. ORGANIZATION OF THE STUDY

The purpose and background for the study has been outlined in this chapter. An explanation of the design of the study, hypotheses to be tested, terms defined, limitations and significance of the study have been included in the discussion.

The balance of the study will be presented as follows:

Chapter II - Review of the Research

Chapter III - Design of the Study

Chapter IV - Analysis of the Findings

Chapter V - Conclusions, Implications
and Recommendations

CHAPTER II

A REVIEW OF THE LITERATURE

This chapter deals with a review of the literature which is pertinent to the problem of language development. In order to clarify the topics under discussion the chapter has been divided into five sections. The nature of concept development in general will be discussed first with a follow-up section on the nature of spatial concept development. The balance of the chapter will be devoted to language as a means of communication and concept learning, factors effecting language development and a brief discussion of methods employed in studying children's language.

I. THE DEVELOPMENT OF CONCEPT FORMATION

The highest forms of human intercourse are possible only because man's thought reflects conceptualization (Vygotsky, 1967:37). A concept is defined by Carroll as ". . . an abstracted and often cognitively structured class of mental experiences," (Carroll, 1964:180). Concepts thus depend upon experiences; perceptual and cognitive, motivational and emotional. Sigel defines a concept as "an adaptive mechanism through which we cope with reality," (Sigel, 1967:209).

Current theory holds that the child's initial perceptions of the world are global, but with time, become more articulated and differentiated, (Kagan, Moss and Sigel, 1963). What a child initially sees, feels, touches, hears or tastes constitutes his perceptual awareness. As the child grows older he tends to differentiate his perceptions. The stimuli become dis-

tinctive and with the development of language, it becomes easier for the child to segregate stimuli. Underwood (1966) believes the study of concept formation is the study of stimuli selection. He thus defines a concept as:

" . . . the abstraction - selection of a common feature, characteristic or property which is present in a number of stimuli which differ on other characteristics," (Underwood, 1966:57).

Concepts dealing with objects and their relationships are the foundations upon which concepts of increasing levels of complexity are based. The concepts are "symbolized and verbalized by the individual and become new concepts with a new hierarchy," (Serra, 1953:131). The young child must first observe the relationships which exist between objects and at the same time learn to verbalize what he sees. The verbalization then becomes the tool by which he is able to differentiate. Differentiation and abstraction proceed simultaneously in the process of conceptualization. Dewey (1910) in his definition of concept concurs with this view.

"Concept is a meaning sufficiently individualized to be directly grasped and readily used and thus fixed by a word," (Dewey, 1910:60).

Thus, the central processes involved in concept formation are (1) discrimination and (2) generalization, (Church, 1961:176-179). The investigation of children's understanding of prepositions of spatial position was concerned with the concepts underlying the spoken word, as well as the use of the terms tested.

Schneider, Rapaport and Reichart, (1960) concluded from their research using the Weigh Color Sorting Test that individuals use three distinct methods of forming concepts: (1) concretistic, (2) functional, and (3) conceptual.

The abstraction behavior of children seems to be primarily on a sensori-motor level and can be designated as manipulative or concrete. In his research, Sigel (1953) found a decrease in perceptual classification with age which was significant between the ages of seven to nine but not between the ages of nine to eleven. This would indicate that concrete experiences should be provided for younger children in helping them form and clarify concepts.

Vinacke (1951) found that the formation of concepts and generalizations overlap. Although a child may have developed a concept, it is unwise to assume that the concept was arrived at in the same manner as that of an adult.

Piaget (1952), Goldstein and Scheerer (1941), Tanner and Inhelder (1960), Werner (1950), Laurendeau and Pinard (1962) believe development follows a general pattern; it proceeds in a sequential invariant order. The phases of development were described by Piaget as stages. From the ages of four to seven years is designated the Preoperational Thought Period. During this stage, a child's:

" . . . conceptualization is perceptually dominated, since his organization, classification and primitive conceptions are determined to a large extent by the potency of the physical attributes," (Piaget, 1952:218).

Thus, the child's utilization of concepts is influenced by the kinds of materials with which he is dealing. There is little argument among scholars that concept development proceeds from the concrete to the abstract. Early educators such as Pestalozzi, Froebel and Montessori emphasized the use of concrete materials with young children as a means of building concepts. Thus concrete materials were used as a means of testing children's under-

standing of prepositions of spatial position.

"The more direct the experience on which a concept is built, the greater knowledge and understanding of it occurs," (Serra, 1953:276).

During the period of Preconceptual Thought, as described by Piaget, the child's development is marked by the dominance of perception and he is unable to see the relationships between the general and the particular. A characteristic of the young child's thinking is his reasoning from the particular to the particular. For example, the young child seeing a bird believes that it is the same bird which he encountered before. He is unable to recognize one bird as a single instance of a larger class.

Scholars such as Ausubel (1957), Estes (1956), Hunt (1961), and Sears (1958) do not believe in stages as invariant sequences but hold rather, that learning experiences influence the child's development. Each level of knowledge, ability and skill, is the result of the function of experiences. Cognitive styles of learning are presumed to influence the kind and content of experiences that a child will employ in evolving his concepts, (Kagan, Moss and Sigel (1963), Sigel (1961)). That experiences play an important part in the acquisition of concepts is further supported by Harlow.

"The concepts that a child acquires are influenced by the predisposition he shows to attend to particular features of the environment," (Harlow, 1959:239).

A single experience is not enough to build a reliable concept. The work of Piaget (1951), Bruner (1966) and others support the proposition that "children cannot move toward abstract structure and reasoning without a broad base of direct encounters from which to abstract and generalize," (Mukerji, 1968:33).

Concepts have five major functions, according to Bruner, in helping

the child to organize his world.

1. Concepts reduce the complexity of the environment.
2. Categorizing is the means by which the objects of the world about us are identified.
3. Categories are based on a set of defining attributes thus reducing the necessity of constant learning.
4. Categorizing enables us to extrapolate attributes from previous experiences and apply them to new situations.
5. Categorizing provides opportunity for ordering and relating classes of events, (Bruner, 1966:155-157).

More basic efforts to formulate and study the developmental course of concept formation in the beginning phases may be found in the writings of investigators such as Deutsch and his colleagues (1964), Hunt (1961), Hess (1963) and Fowler (1962, 1965).

A brief discussion of concept formation has been included in order to provide a base for looking at the development of spatial concepts in young children.

II. DEVELOPMENT OF SPATIAL CONCEPTS

"Perception of spatial position is the ability of the observer to perceive the position of two or more objects in relation to each other," (Frostig, 1966:9). In a sorting task, with children from six to eight years of age, Annette found that explanations of place depend upon physical continuity in space, (Annette, 1959). Her study also revealed that children used four main types of context in classifying materials and the most numerous at all ages were those concerned with spatial position and activity. It

seems that children must analyze individual characteristics of objects and then attend to the way in which objects are organized in space. "Children have little idea as to the spatial relations of objects which they are not actually observing at the moment," (Piaget, 1928).

Concomitant with the acquisition of concepts of object permanence is the acquisition of spatial concepts. Piaget theorizes that the infant's earliest ideas of space, depend upon where the child is at that point, (Sigel, 1964:225). The kinds of spatial relationships suggested by Piaget are:

1. unrelated separate space
2. space perception
3. depth perception
4. differentiation between subjective and objective space.

The latter occurs through manipulation rather than perceptual processes.

Children must be able to respond to the relationships between items in space in order to form a spatial concept. Miller (1934:277) found that a very early clue, which young children employ in ordering objects in the environment, is the position which the objects occupy. The most common spatial relationships noted among young children are those which are the simplest. Watts (1950) found that the positions of 'up', 'down', 'below', 'over', and 'above' and so on were learned by children at the nursery school stage (ages 3-5). The Russian investigator Sohkin (Smith and Miller, 1966) while studying children's understanding of 'on' and 'under', concluded that:

"... it is more difficult to understand under than on, in that the former requires that one object be lifted and the other placed beneath it. Some children held one object

under the table rather than lifting the object lying above it," (Smith and Miller, 1966:383).

Sohkin further argued that the beginning meanings of words are tied to objects and that under in most everyday situations does not require that an object be lifted. Children who had scored incorrectly in the experimental situation were able to show the correct position in an everyday situation. Consequently, prepositions of spatial position, which were investigated in this study, appeared in a normal context with which kindergarten children were familiar.

In discussing children's development of spatial concepts, Piaget (1963) states that the earliest concepts of spatial position are dependent upon the child's sensory-motor and kinesthetic experiences. During the Preoperational Thought Period, the child gains concepts of topological space; the order, closure and continuity of objects in space. Concepts of projective space, which occur later in the Preoperational Stage, evolve when: ". . . the child knows perceptually invariant features of objects viewed is changed," (Meyer, 1940:151).

The third kind of spatial concept which emerges occurs between the ages of nine or ten and is referred to as euclidean space. This involves spatial concepts such as angularity, rectangularity and parallelism. Therefore concepts of spatial relationships are grasped and intertwined with simpler concepts of space based on the child's earliest learnings. "The chief obstacle to any study of the psychology of space derives from the circumstances that the evolution of spatial relationships proceed at two different levels. It is a process which takes place at the perceptual level and at the level of thought or imagination," (Piaget and Inhelder,

1963:3).

Concepts are initially formed through a kinesthetic-manipulatory approach. With the acquisition of language concept development proceeds more quickly since language assists the child in his discrimination and generalization behavior.

III. LANGUAGE AND CONCEPT DEVELOPMENT

Language is intimately connected with conceptualization and thinking. It is through language that concepts are coded, ordered and structured. The problem of studying a child's language development involves understanding the relationship between thought and language. Vygotsky (1967) maintains the solution is to be found in word meaning. It is in word meaning that thought and speech unite. Word meanings are dynamic rather than stable formations and change as the various ways that thought functions change as the individual develops.

"In order to discuss word meanings, it is important that the child be aware of and in accord with, the common agreement concerning each word," (Serra, 1953:276).

The development of language allows us to make the transition from a concrete world (provided directly by the senses) to a world of abstraction and thinking. Language also serves:

". . . to assist memory and facilitate thought, to communicate meaning and, when necessary, to conceal it; to express feeling and when necessary to disguise it; to state intentions or merely to intimate their nature; to influence or control the actions of others; and sometimes to provide substitute satisfactions for those that would normally follow upon the action of bodily activities," (Watts, 1950:17).

The vocabulary of young children consists of words which can be

used for naming and describing what is open to direct observation. However, although the child's early utterances may be words such as "ball" or "baby", the word itself may be only a substitute for the gesture. Thus, Stern (Vygotsky, 1962:30) says that when we observe the child in action in addition to simply listening to his speech, the word conveys much more than the utterance implies. A child then, who says "ball" may in actuality mean "Give me the ball", "Where is the ball?" or "Bring the ball over here."

The advancement of language ability depends upon the progressive clarification of experiences. Language both facilitates and directs the categorization process, since it provides the tools by which to identify the commonalities. As more and more objects and events are noted, and their qualities and relationships learned, the ability to think of them apart from their concrete existence increases. A number of researchers (Dunkel, 1944, Chambers, 1904, Jespersen, 1922, and Buehler, 1927) have found that both maturity and education lead to the ability to determine the precise use of words. Children learn early to narrate or imitate speech but we must be on guard against assuming that they use a more complex and exact understanding than that of which they are capable.

"Words are symbols of reality which permit us to manipulate knowledge concerning reality," (Kraus, 1958:110). To very young children, the word does not represent reality but is an intrinsic part of objects. It is known that actual objects and pictures of objects elicit different responses than do names of objects, (Rheingold and Bayley, 1959, Everett 1968). In analyzing children's vocabulary Dolch (1927) concluded that words causing the most difficulty were those that acted as symbols for abstractions or generalizations.

As the child matures, an increasingly prominent aspect of his verbal behavior is the degree to which it corresponds to the syntactical structure of his language, (Watts, 1950:111). Young children are unable to pick out words as single entities. Thus words such as "knife" and "fork" become a single entity in "knifenfork". A test which involves recall vocabulary entails the assessment of a child's knowledge of words which he understands or the meanings of which he knows. He may understand the words in context but is unable to isolate distinct words in order to give an explanation of them. Fisher (1930) found a correlation of .86 between children's ability to use things and talk about them.

Since a child's initial language is tied to the concrete, the first words learned are normally nouns. Stein established that the parts of speech emerged in the following manner:

" . . . all words used at fifteen months were nouns, at twenty months 78 per cent were nouns and 22 per cent were verbs, at twenty-three months 63 per cent verbs and 24 per cent other parts of speech," (Stein, 1927:79).

Most nouns hold as class names but only with particular objects. The child spontaneously makes combinations and gives them meaning by attaching them to particular experiences. Nice (1917) expresses the belief that complex sentences appear after four years of age. Buehler hypothesizes the order in which subclauses of complex sentences appear is as follows:

1. temporal and relative clauses and noun clauses in direct questions.

2. causal conditional and final clauses (Buehler, 1927).

Different syntactical structures, representing different parts of speech and different degrees of complexity have different degrees of power in

facilitating learning. The largest difference in "connective power" is that between conjunctions and prepositions, (Rheingold and Bayley, 1959). Gesell (1925), in an earlier study, concluded that maturation played an important role in the mastery of pronouns and prepositions. One of the objectives of the present study was to determine if kindergarten children had reached the level of maturity at which prepositions of spatial position were mastered. Watts (1950) discovered that pronouns appeared at the same time as the ability to use plurals and the past tense. Prepositions which denote position in space are also learned as a result of maturation and experience.

"The infant does not at first understand what is meant by (prepositions of spatial position) if his mental age is much less than four, as may be seen when he is asked to make a drawing to illustrate a fairy tale or nursery rhyme," (Watts, 1951:41).

Thus, it would seem that the ability to think and talk of objects remote in time or space is a later developmental achievement. It is possible for the child to use subordinate clauses with words like 'because', 'if', 'upon' long before he really grasps causal, conditional or temporal relations, (Vygotsky, 1962:46). This phenomena is possible because much of children's language is learned by imitation. From the many indications in the literature we know that the language a child hears about him is the language that he acquires.

Prepositions do not appear among eighteen month old children and increase in frequency with age from about three per cent at two years to approximately seven per cent among children of four and five years, (McCarthy, 1930). This finding concurs with the process of concept development as the child passes from the concrete to the more abstract means of

thinking. "Formal language includes frequent use of prepositions which indicate logical relationships as well as prepositions which indicate temporal or spatial contiguity," (Luria and Yudovitch, 1961:92). The learning of relation words, such as prepositions, are important because they allow us to interpret our perceptions and recall them after they have passed out of our field of perception.

"If we do not understand words such as round, square, over, above, or their equivalents, even the best of us would continue all our lives to grope about in a world limited entirely to knowledge provided directly by the senses," (Watts, 1950:23).

The acquisition of language assists the child in his concept development. The more rapidly the child learns to use his language as a tool for logical thinking, the more quickly he will be able to organize and understand his world.

III. FACTORS INFLUENCING LANGUAGE DEVELOPMENT

The attainment of language skills is dependent upon many factors in the child's environment. Language development does not proceed at the same rate for all children.

Socio-economic Status

According to Piaget (1928) the very essence of the cognitive development of children is the socialization of thought which occurs within the child's environment. The structure of the social system and the family shape communication and language. Language shapes thought and cognitive styles of problem solving.

Many writers (Brophy, Hess and Shipment, 1965, Deutsch, 1965, Kagan, 1966) define the conceptualization of social class as an array of

experiences and quality of experiences, which can be examined in the light of their effect on a child's mental development.

The growth of cognitive and language processes is promoted in family control systems which offer and permit a wide range of alternatives of thought and action. Families in which predetermined solutions and few alternatives are given, restrict language growth. Luria (1959) postulates that children from lower socio-economic families are hindered in their language development because of little verbal interaction or reinforcement for verbal communication within the home. During the early years of life, the mother's influence is usually the most potent determiner of language patterns. In a research project carried out by Brophy, et al (1965) the mother and child were asked to perform a task in which the mother's role was one of teacher. Mothers from the lower socio-economic status tended to use gestures and less verbal output in response to questions and tasks requiring a verbal response than did mothers of children from a high socio-economic status.

Ausubel (1967) notes that the most obvious differences in social structure are those of verbal output. The gross differences in verbal output are due to the limitations of the particular social structure. In a lower socio-economic setting, complex verbal procedures are made irrelevant by the systems of non-verbal, shared experiences which are expressed by means such as gestures.

"Generally speaking, the smaller the circle, and the more complex the understanding already arrived at within it, the more economical can the act of communication afford to become," (Sapir, 1931:79).

The middle-class child experiences a progressive verbalization which

is denied a child of a lower socio-economic background. In the latter there is less verbal play and verbal interaction for the child to imitate, (Rheingold and Bayley, 1959). Johns (1964) concluded from her study on the "social context of language acquisition" that children from lower class homes must learn the language through hearing rather than self-corrected speech practise. She maintains that it is through kinesthetic experiences such as seeing and touching that the child forms his word associations.

" . . . motor exploration can be perfected by a child on his own, but language as an effective internal process can only be learned from others . . . In a background rich in verbal skills the child has a better opportunity to learn the role of speaker and listener," (John, 1963:818).

The differences in verbal output have been described by Bernstein (1965) as two distinct forms of language; restricted and elaborated. A restricted language is limited and lacks specificity and exactness for conceptualization and differentiation. Therefore, a child who uses a restricted language is hampered in his language and conceptual development because the number of alternatives available are limited. Use of the restricted language exclusively, reduces the probability of transfer from the concrete to an abstract mode of thought since:

"A child using a restricted code hasn't acquired sufficient ability in relating abstractions to each other, (due to lack of practise) with the help of concrete props, so that he can later dispose of them," (Ausubel, 1967:315).

Because the child from the lower economic-status tends to rely on the restricted code to communicate, the result is that he is more apt to be tied to the concrete stage of operations. Thus, he doesn't learn as readily for he is unable to function adequately at an abstract-verbal level. This phenomenon was tabulated by Kagan, Moss and Sigel (1963) in

describing the results of their research:

" . . . the relative absence of descriptive part-whole responses for other than the middle-class class group and the large rise in non-verbal responses below the middle-class level. These results seem to reflect the relatively undeveloped verbal and conceptual ability of children from homes with a restricted range of verbal and conceptual ability," (Kagan, Moss and Sigel, 1963:112).

The transition from home to school often proves difficult for the child from a low socio-economic strata because the language of the school is not the language of his environment.

It is this factor that has great importance for educators. The teacher must know and understand the child's language background in order to "(1) facilitate meaningful communications and (2) provide a starting point from which to build on the language which he does possess," (Deutsch, 1963:167). This does not imply that the teacher must attempt to train the child to use a higher level of language, but lead him to become aware of other levels of language and their potential utility.

The effect of socio-economic status on acquisition of prepositions of spatial position was examined to determine whether children from all social stratas attained these language skills, with equal facility. "Every cultural pattern and single act of social behavior involves communication in either an explicit or an implicit sense," (Sapir, 1959:75).

Age

As mentioned in a previous section of this chapter, language development follows a pattern which closely coincides with concept development. It is important to investigate children's language ability at varying age levels in order to understand the changes which occur within certain periods of the child's life. Piaget (1928) concentrated on the distinctive charac-

teristics of the child's language in terms of what the child has, rather than on what he lacks. Linguists today are primarily interested in learning the process by which children reinvent the major rules of syntax.

The role of language changes as the child grows up. At first he uses language largely as a social function, to indicate his moods and needs. Later, as language becomes internalized it becomes an instrument for thought. The pre-school child who uses egocentric speech (a sort of monologue) is at an intermediate stage, during which, his voiced, egocentric speech fulfills the functions of inner speech, (Vygotsky, 1962). The data strongly suggests that egocentric speech is a transitional stage from vocal to inner speech. "There are highly complex changes in the interrelation of activity and egocentric thought," (Vygotsky, 1962:71).

The uses of speech closely coincide with the sequences through which a child passes in his pictorial attempts. He first uses egocentric speech to mark the end result of an activity. As he grows older, he uses speech in the middle of an activity and finally at the beginning of an activity. At a later stage:

"... speech takes on a directing planning function and raises the child's acts to a level of purposeful behavior," (Pines, 1967:189).

In order to determine how children learn their language, it is necessary to examine the ages at which certain phenomena appear.

"Each stage of language development can be compared to a different program for the child's computer - his brain. His early programs are not only simpler, but different from the ones he uses later," (Pines, 1967:187).

Several investigators (Brian and Goodenough, 1929, Brown and Bellugi, 1964, Feifel and Lorge, 1950, and Werner, 1950) have discovered various

patterns which emerge in the child's language development. The first vocalizations of the child imply bodily discomforts but by six months sounds are made for their own sakes. From six months to twelve months the child is symbolizing his vocalization by repeating sounds and using holophrases such as "come" "see". By eighteen months of age he begins to use two word utterances which have a grammatical structure such as "come see". It is interesting to note that the early two word utterances make use of onomatopoeic patterns which are easily remembered ("Puff-puff" "Ta ta"). The child is able to take a single holophrase and use it as a hinge on which to hang other words.

"The rate at which the child operates on this pivot class is very striking. In the first week you usually get five or ten instances of the use of the combinational form; the second week it will jump to say seventy, and the next week to seven hundred. From then on out it just explodes," (Bruner, 1960:121).

Jagger (1929) estimated that at kindergarten age words increased at the rate of 800 per year. The average child of five has a vocabulary of 2,000 words, at seven 4,000 words and at fourteen between 8,000 and 10,000 words.

It is not only the quantity of words that the child has acquired but the quality of his vocabulary at various ages which is important. The problem is:

". . . when a child has several alternative meanings before him, which level of meaning, concrete, functional or abstract, does he use?" (Hurlburt, 1954:563).

The results of recent investigations confirm that until the age of six or seven, children use terms which are more descriptive and of use than explanation, (Feifel and Lorge, 1950). Functional and concrete meanings

predominate until the ninth year of life, (Hurlburt, 1954, Reichard, et al 1962).

Smith (1926) found the most significant trend in language development with age was an increasing tendency toward the use of longer and more complex sentences. The number of simple sentences with phrases also increases with age.

McCarthy (1930) found that differences in language were more marked in children in the younger age levels, when they show the most rapid rise in vocabulary development, and are less marked in older children, when language development is slower. The study also revealed that the use of prepositions did not appear at all among the eighteen month old children and increased with age from about three per cent at two years to about seven per cent among four and five year olds.

In a study carried out in the Soviet Union by Feofanov (Smith and Miller, 1966) children, from three to seven years, were asked to describe pictures and actions and the prepositions used were recorded. The earliest prepositions noted were those which occurred most frequently in the language and were also those having the greatest number of meanings.

"Initially their use is confined to relations with a concrete meaning understood by the child from visual perception (space relations, relations involving mutuality . . .); then it extends to relations without such visual support (relations of purpose, time relations, and space relations used figuratively)," (Smith and Miller, 1966:367).

Thus, from the literature it appears obvious that varying age levels do influence the sequence and uses of language. The importance of considering age in examining language development of children is outlined by Smith.

"When we are dealing with a function which develops as readily as does the child's language, it seems that whole year age groups are so large and have so many variations within them, that the stages of developmental process may be obscured," (McCarthy, 1930:36).

It has been stated that the age at which children acquire various language skills varies with their sex. Thus, the child's sex may also influence his language development.

Sex

Researchers have considered differences in sex when looking at a child's language development. O'Donnell, Griffin and Morris (1967) found differences, between males and females, in the way in which they used syntactical structures. There was a slight tendency for girls to score higher on the written responses and boys to score higher on oral responses. These differences however, were not statistically significant as fluctuations occurred with the scores.

Girls' scores were higher than boys on the language aspect of the Dominion Group Test of Reading Readiness for grades one and two on standardized mean scores. The differences in scores are attributed to the girls being more verbal than boys. It has been hypothesized that girls are engaged in activities, which require more verbal interaction and modelling, than boys. Thus, girls tend to lead the boys in vocabulary development. Smith states:

"Girls are likely to begin the acquisition of a vocabulary at an earlier age than boys, but the sex factor is not important after three years of age," (McCarthy, 1930:22).

McCarthy (1930) found that sex differences, although slight, were consistently in favor of the girls. However, in studying children's use

of prepositions, she found:

"No consistent sex differences appear in this part of speech; as there are several reversals of the direction from one age level to another," (McCarthy, 1931:117).

The mean number of words secured from the girls in the study was greater than that secured from the boys at the lower age levels. As various parts of speech were analyzed, it is impossible to say whether the girls exceeded the boys on all levels of vocabulary development. Doran believes that:

"We are not warranted in saying which has the better vocabulary after the age of twenty-four months, though it is possible that further investigation will show that girls surpass the boys up to the fifth or sixth year," (Doran, 1907:58).

Studies concerned with discovering various aspects of language development have examined the variable of intelligence and its effect on subjects' responses.

Intelligence

Terman (1918) Weisenberg and McBride (1936) as well as others, have stressed the relationship which exists between intelligence and vocabulary development. Weschler (1949), Dale and Reichart (1957) have found measuring a child's vocabulary the best indicator of grade one success.

Basically, there are two kinds of vocabulary tests utilized in measuring intelligence, (1) recall and (2) recognition. Intelligence tests using these criteria include the Peabody Picture Vocabulary Test (1965) Weschler Intelligence Scale for Children (1949) and The Revised Stanford-Binet Test of Intelligence (1937). Although both types of vocabulary (recall and recognition) tap the subjects' comprehension of the

spoken word, other influencing factors tend to be ignored. Labercane (1967) found that children, from low socio-economic classes, had inferior recall and recognition vocabularies. The danger then in measuring intelligence through vocabulary alone, lies in the false assumption that all children have similar verbal models and experiences.

Nisbitt (1953) thought that part of the negative correlation he found between intelligence and family size was the result of the type of speech model made available to the child. That children from lower socio-economic status tend to score lower on intelligence tests, which contain verbal responses, is well documented. Reissman believes that this is due to the emphasis placed on the verbal response which hampers the low-socio-economic child because:

" . . . child is a physical, action-centered learner who tends to work out mental problems best when he can do things physically," (Olsen, 1965:552).

Thus, a test which measures a child's verbal ability as an indication of his intellectual capacity, is weighted in favor of the middle and upper class child.

The related literature supports the view that sex, age, socio-economic status and intelligence influence language development.

Many methods have been employed in order to study the child's language. A few of these methods will be described in the succeeding section.

IV. METHODS OF STUDYING LANGUAGE

There are numerous studies, cited in the literature, on assessing children's language development, (Piaget, 1928, McCarthy, 1930, Holmes, 1932, Watts, 1950, Annette, 1959, and Sohkin, 1966). Each investigator

has been concerned with the problem of examining the child's language and concept development in the most meaningful and valid manner.

Counting the words children used was the standard procedure for determining vocabulary development. Dolch and Leeds (1953) point out the disadvantages of such a method:

" . . . the majority of vocabulary tests tested the first definition of the word given in the dictionary as correct. This method ignores 1) words which have the same spelling but different roots, 2) words with derived meanings and 3) words with figurative meanings," (Dolch and Leeds, 1953:182).

Estimating the number of words a child has in his vocabulary does not yield valuable information about the quality of his vocabulary. The meanings attached to the child's speech are important in order to determine how the child thinks as well as how he progresses in his verbal expression.

In 1930 McCarthy carried out an investigation of children's language by recording samples of their language from a random sample population. The purpose of the study was to:

" . . . add to our knowledge of development of the language of the child . . . The function of language in the child's life, the changes in the lengths of sentences, the complexity of sentence structure, and the proportion of the various parts of speech which occur," (McCarthy, 1930:24).

The subjects were grouped for age, sex, intelligence and parental occupation variables. Each child was observed in his natural environment and fifty consecutive responses recorded by the examiner. Responses were divided into three categories: (1) comprehensible responses, (2) semi-comprehensible responses and (3) incomprehensible responses which were classified as single sounds, repeated sounds or series of varied sounds.

(McCarthy, 1930:35-36). Each response was further analyzed for words, length of response and complexity of response.

McCarthy's findings suggest that the period from one to three and one half years is one of rapid growth. It is important to study these early roots of language on which more complex language structure is based.

At approximately the same time, Holmes (1932) was carrying out a similar study with American pre-school children. The purpose of her study was "to bridge the gap between the knowledge of language usage and of language comprehension," (Holmes, 1932:269). The child was asked to point to the thing named while the examiner pointed to another object in the test booklet. A correct response was recorded and the child retested later and responses compared. On the second part of the test, the child was given a teddy bear and asked to move it in the direction indicated in the story; example: the bear jumped backwards. When the children's responses were analyzed:

"80 per cent knew the terms 'on top', 'behind'; at five years of age they understood 'backward' and 'foreward'. Not more than 60 per cent grasped the distinction between 'tiny' and 'huge' and less than 50 per cent showed understanding of 'far' and 'near'," (Watts, 1950:150).

In 1941 Watts carried out a research project to determine whether children understood prepositions in their language. The children were requested to draw pictures of nursery rhymes which indicated prepositions; example: The cow jumped over the moon; The mouse sat under the chair. Children under the age of five were seldom able to depict terms of spatial position and Watts concluded they were learned as a result of maturation and experience.

Osborne, Huntington and Meeks (1949) used sixty-seven kindergarten children in their study of vocabulary development. The children were given exercises in which pictures were shown. The examiner illustrated the relationship between pictures used.

"The findings were that experiences with pictures, illustrations and models . . . should be used to make concrete relationships shown in language," (Osborne, et al, 1949:601).

Children's responses to these methods of investigating language imply that use of concrete materials is necessary with young children. The field of language is extremely large and the only way in which we may hope to learn about children's language is by studying particular aspects of it and combining the many parts to make a whole.

Sigel (1953, 1954) carried out an investigation to determine whether modes of representation affect children's responses. He found no significant differences in classification behavior using variations of representational material. In a subsequent study carried out (Sigel and Olmsted, 1968) it was found that when pictures were used as stimuli, the lower class children had significantly more difficulty in creating groups and explaining them than did middle-class children. Sigel and Olmsted concluded the mode of representation made a difference in grouping behavior with lower class children. No differential effects of verbal and pictorial representations of stimuli upon responses were found but they did find actual objects elicited different responses.

More recently, Sohkin (1966) carried out a study to discover children's knowledge of prepositions. A cross-sectional study of forty-three children between one year eleven months and three years five months

were used. To test their understanding of terms the children were asked to place objects on or under one another. Three groups of children were tested,

1. eleven children from 1 - 11 to 2 - 4; children played with objects.

2. eighteen children from 2 - 2 to 3 - 0; correctly placed an object on another but often making reverse placements.

3. fourteen children from 2 - 2 to 3 - 5; performed adequately.

The researcher concluded that it is more difficult for children to understand the preposition 'under' than 'on' since 'under' requires that an object be lifted and the other placed beneath it. Since the beginning meanings of words are tied to actions, Sohkin argues, that 'under' in most everyday situations does not require that an object be lifted. Thus, many children who had difficulty in the experimental situations could often show correct comprehension of a preposition in an everyday situation. Children who had difficulty understanding the prepositions, did not use them in their speech.

"Because of the wide developmental range of children within any chronological year, it is impossible to draw a blueprint of a good program for every three year old group, for every five year old group or for every seven year old group. Consequently, we are obliged to temper and adapt our teaching not only to the developmental levels of growth and learning but also to the specific styles and tempos of individual children," (Murkerji, 1965:30).

V. SUMMARY

This chapter dealt with concept formation in general and development of concepts of spatial position in particular. It was indicated

that language plays an important role in concept development and that particular factors such as age, sex or socio-economic status affect a child's language development. The concluding section described some methods which have been used in studying language.

CHAPTER III

DESIGN OF STUDY

The procedures used for testing the hypotheses, stated in chapter one, are outlined in this chapter and include the population, the sample, a description of the test, scoring procedures and method of treating data.

I. POPULATION

The population was drawn from 139 subjects in kindergarten classes in the city of Regina. All children in the population attended kindergartens administered by the Regina Board of Education. The classes from which samples were drawn were selected by the Regina Board of Education and included two schools from a low socio-economic area and two schools from a high socio-economic area. The socio-economic status of the population was determined by the Blischen Occupational Scale (1961).

II. SAMPLE

The sample consisted of sixty subjects selected on a random basis from the total population described above. Subjects in the sample were grouped according to age, sex and socio-economic status.

Information on the age and sex of subjects was collected from the subjects accumulative record cards. Two age groups were established by dividing the population into six month age periods. Subjects in age Group One ranged in age from five years eight months to six years two

months. Age Group Two consisted of subjects whose ages ranged from six years three months to six years nine months.

Socio-economic status was determined by using a combination of the Blischen Occupational Scale (1961) and a modified version of Elley's Revision of the Gough Home Index Scale (1961). The modification of the scale contained two major revisions: (1) questions were reworded so as to be directed to parents and (2) three or four items were made more explicit. For example, "Do you own a car?" was changed to "Does your family own more than one car?" In order to insure that the information received was accurate, each subject in the population was given a questionnaire for parents to answer. A letter explaining the nature and purpose of the questionnaire was enclosed. (See Appendix A)

The total scores of the Blischen Occupational Scale and the Gough Home Index were summed. Subjects with a score of sixty or more were designated as high socio-economic status. A total score of forty or less was designated as low socio-economic status.

The number of males and females selected for each socio-economic status and age group were equal. There was a difference of two in number between age groups in female and male samples, for each socio-economic strata used. The total number of males and females in the population were equal. (See Table I)

Testing

The Peabody Picture Vocabulary Test (1965) was administered, to each subject in the sample population individually, in order to obtain an intelligence quotient score.

TABLE I

Distribution of Subjects Within the Sample Population

	AGE GROUP	HSES	LSES	TOTAL
MALES	I	8	8	16
	II	7	7	14
	TOTAL	15	15	30
FEMALES	I	8	8	16
	II	7	7	14
	TOTAL	15	15	30
	TOTAL POPULATION	30	30	60

III. TEST OF PREPOSITIONS OF SPATIAL POSITION

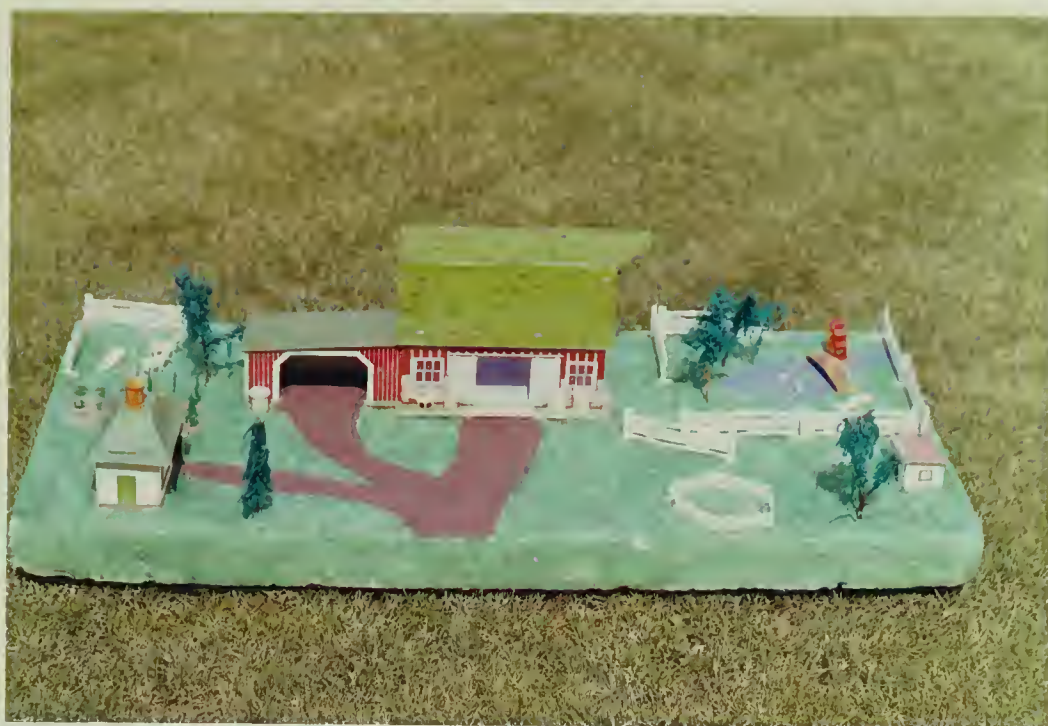
The test was developed by the researcher, and was designed to test the subjects understanding of prepositions of spatial position. Prepositions of spatial position were tested under three sections; Non-Verbal response, Controlled-Verbal response and Free-Verbal response. Each section of the test contained the following prepositions of spatial position as follows:

- | | |
|----------------|------------------|
| 1. underneath | 11. between |
| 2. on | 12. through |
| 3. beside | 13. above |
| 4. around | 14. on the right |
| 5. in front of | 15. outside |
| 6. near | 16. on the left |
| 7. out | 17. across |
| 8. behind | 18. beneath |
| 9. on top of | 19. inside |
| 10. over | 20. below |

Testing Materials

Test materials consisted of a model farm with miniature buildings, people, animals and machines. Subjects were asked to manipulate the objects in a specified manner or observe how the objects were manipulated.





1. Non-Verbal Response

The subject was asked to listen carefully to a direction given by the examiner. One or two sample directions were given in order to establish whether the subject understood what he was to do. Objects to be manipulated were given to the child before each direction.

Examples:

Put the tractor beside the barn.

Put the sheep between the trees.

A suitable time was allowed between directions for the child to move around the farm and decide on a placement. If the subject hesitated, the examiner encouraged him by responding in the following manner:

"Put the tractor where you think it should go."

or

"Show me the barn. Put the tractor beside the barn."

No indication was given to the subject as to the accuracy or inaccuracy of his choice.

2. Controlled-Verbal Response

Subjects were asked questions as to possible positions of objects. The examiner explained to the child before testing commenced that if the reply was "yes", he would be asked to make the placement. If the answer were "no", he would be required to tell why he thought the object could not be so placed.

Example:

"Can a horse go inside the barn?"

"Yes."

"Show me how a horse can go inside the barn."

or

"Can the farmer sit underneath the henhouse?"

"No."

"Why do you think the farmer cannot sit underneath the henhouse?"

3. Free-Verbal Response

The examiner told a story about the farm, leaving out the prepositions of spatial position. Where the prepositions were omitted, the examiner demonstrated the position by placing the object involved on the model. A number of examples were given before the testing began to make it absolutely clear to the subject what he was to do. This section of the test was recorded on a tape recorder to insure the accuracy of the transcript of given responses.

Example:

The examiner says, "The dog jumped (move the dog over fence) _____ the fence."

If no response was given, the child was encouraged to try again, by further directions.

"Watch again. Tell me where the dog jumped."

(Move dog over fence)

"The dog jumped _____ the fence."

IV. JUSTIFICATION OF THE TEST

Gibson and Olum (1960) have pointed out the necessity for adapting methods of testing to suit the ability of the child.

"Adapting a technique to suit a given age group should be cautious however. Instructions should be kept essentially the same. Varying instructions to suit the child's vocabulary can bias results as can failure to understand the task," (Gibson, et al, 1960:318).

The test was constructed with the vocabulary of kindergarten children in mind. In addition, all of the children in the population had studied or were presently studying the farm, when the research project began. Consequently, the background experiences and interests of the population were considered in the construction of the test.

Osborne, et al (1946:587) states that: ". . . using objects helps the child make concrete the relationships implied in language." Several authors (Carroll, 1964, Goldstein and Scheerer, 1941, Everett, 1968, and others) have stressed the role that experiences with concrete stimuli play in language development.

All sections of the test were administered under constant conditions; that is, the stimuli were identical for all parts of the test. Watts believes that a common denominator is important in language tests in order

that:

"The child is confronted with a problem situation in which language has to be understood and/or used for the task to be accomplished correctly," (Watts, 1950:280).

Because the test was designed for kindergarten children, the researcher felt that it should be based on a background of direct experience. The research was concerned with whether children understood and were able to use, prepositions of spatial position. As Whitehead point out:

"The success of language in conveying information in the absence of a background of direct experience may be easily overrated," (Whitehead, 1930:214).

By having the subjects manipulate objects as well as describe their spatial position, the element of guessing was controlled.

V. PILOT STUDY

A pilot study was carried out in March, 1969, at the Elementary Education Kindergarten at the University of Alberta, to assess the suitability of the test and scoring procedures.

The Non-Verbal section of the test was administered by asking children to place familiar objects in a designated position.

Example: Put the ball under the chair.

In the second section of the test children were asked to place two pictures (cut from felt) in a spatial position described. The sentences used were largely from rhymes and stories with which kindergarten children are familiar. After repeating the sentence, the children were asked to place the pictures on the felt board.

Throughout this aspect of the test, two difficulties became evident. The use of pictorial stimuli led to discrepancies in determining the position, since the stimuli involved two-dimensional rather than three-dimensional objects. In order to place the mouse under the chair, the child had to put one object over another. Sohkin discovered similar discrepancies when stimuli were taken out of their normal environment. Difficulties in scoring arose in determining the position of an object. For example, when asked to place the mouse under the chair, the child could conceivably place it beside the chair between the chair legs. In this case, it is under the chair in a three-dimensional setting but also beside the chair in a two-dimensional setting.

The Controlled-Verbal response consisted of sentences in question form, using terms of spatial position. The child was to give a "yes" or "no" reply.

When children were questioned as to why a positive or negative answer had been given, it was found that a correct answer was often due to guessing on the part of the child. Thus the information sought, (the child's comprehension of prepositions of spatial position) was not obtained.

To examine the child's ability to use terms of spatial position in response to stimuli, pictures and concrete objects were used. The child was requested to describe, verbally, the spatial position of particular objects.

Throughout the pilot study several difficulties were discovered. To eliminate some of the problems, a constant stimulus was introduced; the model farm. The Controlled-Verbal response was expanded to include a

control over conjecture by the child by adding an explanation or placement to the response.

Kindergarten children from Glenora Kindergarten in the city of Edmonton were subsequently used in a second pilot study with the revised form of the test.

Questioning techniques, as outlined in Section III of this chapter, corresponded to the children's vocabulary level and they exhibited no problems in understanding directions. The procedure of giving sample questions to clarify directions met with success with the children. All children responded favorably to the stimuli and were eager to manipulate the objects, thus keeping interest and motivation high.

Scoring procedures used, as described in Section VII of this chapter, yielded consistently high agreement. Inter-judge reliability was calculated using the Arrington Formula.

An independent scorer was present during the testing situation and was directed to score responses as either correct or incorrect. The interjudge reliability agreements were expressed in percentages. Percentages of agreement were found to be ninety-three per cent on the Non-Verbal and Controlled-Verbal response and ninety-six per cent on the Free-Verbal response sections respectively.

Questioning techniques, stimuli and scoring methods were accepted for this study on the basis of the initial pilot study results and the test revision results as examined during the second pilot study.

VI. DATA COLLECTION

Testing conditions were kept as constant as possible, with all

subjects using the same testing materials. Subjects were tested individually in a quiet room with only the examiner present. All subjects had met the examiner prior to the testing situation and had seen the model farm. The test was composed of three component parts.

The administration of the test was given in two sessions. Half of the children were given the Non-Verbal and Controlled-Verbal sections first and the balance received the Free-Verbal section first. The test was administered in this manner in order to eliminate any carry-over in responses from one section to another. The researcher wished to determine if children scored better on one section of the test than another and was able to ascertain this by giving the sections separately. A time lapse of two weeks existed between testing sessions with each child to eliminate practise effects on responses.

The following schedule was used, for testing subjects in the sample:

TABLE II

Schedule for Testing the Sample

	HSES	LSES
AGE I	FREE-VERBAL 8	NON-VERBAL & CONTROLLED-VERBAL 7
AGE II	8	7

	HSES	LSES
AGE I	NON-VERBAL & CONTROLLED-VERBAL 7	FREE-VERBAL 8
AGE II	7	8

The children were introduced to the tape recorder before administering the Free Verbal response section. Children were allowed to experiment with the microphone by having them speak into it and the tape played back. It was hoped that the artificial factor introduced into the testing situation was minimized by this approach.

VII. SCORING PROCEDURES

Two scoring procedures were developed assessing subject's responses. Scores for the Non-Verbal and Controlled-Verbal responses were designated by assigning a one for a correct response and a two for an incorrect response.

Example:

Non-Verbal

Examiner: Put the cow behind the barn.

Placement: behind,	= 1
beside, in front of, or other position	= 2

Controlled-Verbal

Examiner: Can the pig walk through the pen?

No - - - there isn't a gate.	= 1
Yes- - - places pig in the pen.	= 2

Scoring on the Free Verbal response section of the test was divided into three categories: correct responses, plausible response and incorrect response. Both the examiners speech and the child's responses were transcribed from the tape and typed, (See Appendix D, p.116). Correct responses were recorded if the child used the precise preposition; plausible responses and incorrect responses were also noted.

Examiner: The farmer put the box down beside the tree.

Reply:	Beside the tree	= Correct
	By the tree, at the tree	= Plausible
	In the tree	= Incorrect

Total test scores were tabulated for the Non-Verbal and Controlled-Verbal sections of the test and compared.

VIII. ANALYSIS OF DATA

Children's understanding of prepositions of spatial position were examined with the variables of age, sex, socio-economic status and intelligence considered.

A three-way analysis of variance with one factor repeated was used to analyze a portion of the data. Non-Verbal and Controlled-Verbal responses represented the repeated measure with the variables of age and sex examined for significant interaction. The program allowed for analysis of a three-way or two-way interaction on responses received. Due to the limited number of variables which could be included in the program, the program was repeated, using the variables of sex and socio-economic status in the second analysis.

A two-way analysis program was used to determine the effect of intelligence on subject's scores.

An item analysis, using individual scores on the Non-Verbal and Controlled-Verbal responses, was used. This program enabled the researcher to determine correlations between responses of identical prepositions on both aspects of the test.

Free Verbal responses were analyzed by the researcher using non-statistical methods to ascertain the ways in which children express spatial

positions through their language.

Interactions of variables and their effects on responses obtained, are described in Chapter IV. The .01 and .05 levels of significance were used in these analyses.

IX. SUMMARY

This chapter dealt with the procedures and methods employed to investigate the problem. Selection of the sample, test materials, scoring procedures, and means of analyzing the data have been discussed.

CHAPTER IV

ANALYSIS OF DATA

This chapter presents the findings of the study. The Non-Verbal and Controlled-Verbal response sections of the test were subjected to a statistical analysis using the following programs:

1. three-way analysis of variance with a repeated measure.
2. t-test for differences between means and variances
3. two-way analysis of variance for one-tail and two-tail measures.

The Free-Verbal response section of the test was analyzed by the investigator and will be discussed separately in a later section of the chapter.

The effect of age, sex, socio-economic status and intelligence on pupil achievement, as measured by test scores on each mode of response were included in the analysis. Scores obtained on the Non-Verbal and Controlled-Verbal response were analyzed using a three-way and two-way analysis of variance and the correlated t-test of difference between means. Scores obtained on the Free-Verbal response task were analyzed by the researcher in a non-statistical manner. Test scores for the total population of sixty were subjected to each analysis with the exception of test scores for subjects when considering the variable of intelligence. Each mode of response included the twenty prepositions of spatial position given in Chapter III.

I. COMPARISON OF SUBJECT'S SCORES FOR TWO MODES OF RESPONSE

The total mean scores obtained by subjects for each mode of response (Non-Verbal and Controlled-Verbal) are given in Table III (p. 52). An examination of the mean scores reveals that subjects scored higher on the Non-Verbal response (15.10) than on the Controlled-Verbal response (12.93). Figure I illustrates this difference graphically. Table IV (p. 53) shows that the difference between test scores achieved for the two modes of response was significant beyond the .001 level. This data clearly indicates that children are better able to demonstrate an understanding of prepositions of spatial position using the Non-Verbal response than when using the Controlled-Verbal response.

A three-way analysis of variance was carried out considering the variables of age, sex and mode of response in order to determine if there was an interaction between the variables. Table IV (p. 53) presents the findings of this analysis. There was no significant three-way interaction among the variables considered, but a two-way interaction between sex and mode was evident. Thus, the subject's sex provides a predictor for his success on the mode of response.

Table IV indicates that age is a significant factor, at the .01 level, in determining scores achieved. In order to discover where the area of significance occurred, the age factor was broken down into its two component groups. These age groups and their mean scores for the two modes of response considered are given in Table V (p. 54). The differences in mean scores for each age group on the Non-Verbal (14.83 and 15.36) and Controlled-Verbal response (13.76 and 12.10) were significant

TABLE III
DIFFERENCE OF MEAN SCORES OF NON-VERBAL
AND CONTROLLED-VERBAL RESPONSE FOR
TOTAL POPULATION

	MS-NV	MS-CV	SS	DF	MS	F	P
TOTAL POPULATION	15.10	12.93	.14083	1	.14083	44.01	.000*

*Significant $< .001$ level.

FIGURE I
DIFFERENCES IN MODES OF RESPONSE
FOR TOTAL POPULATION

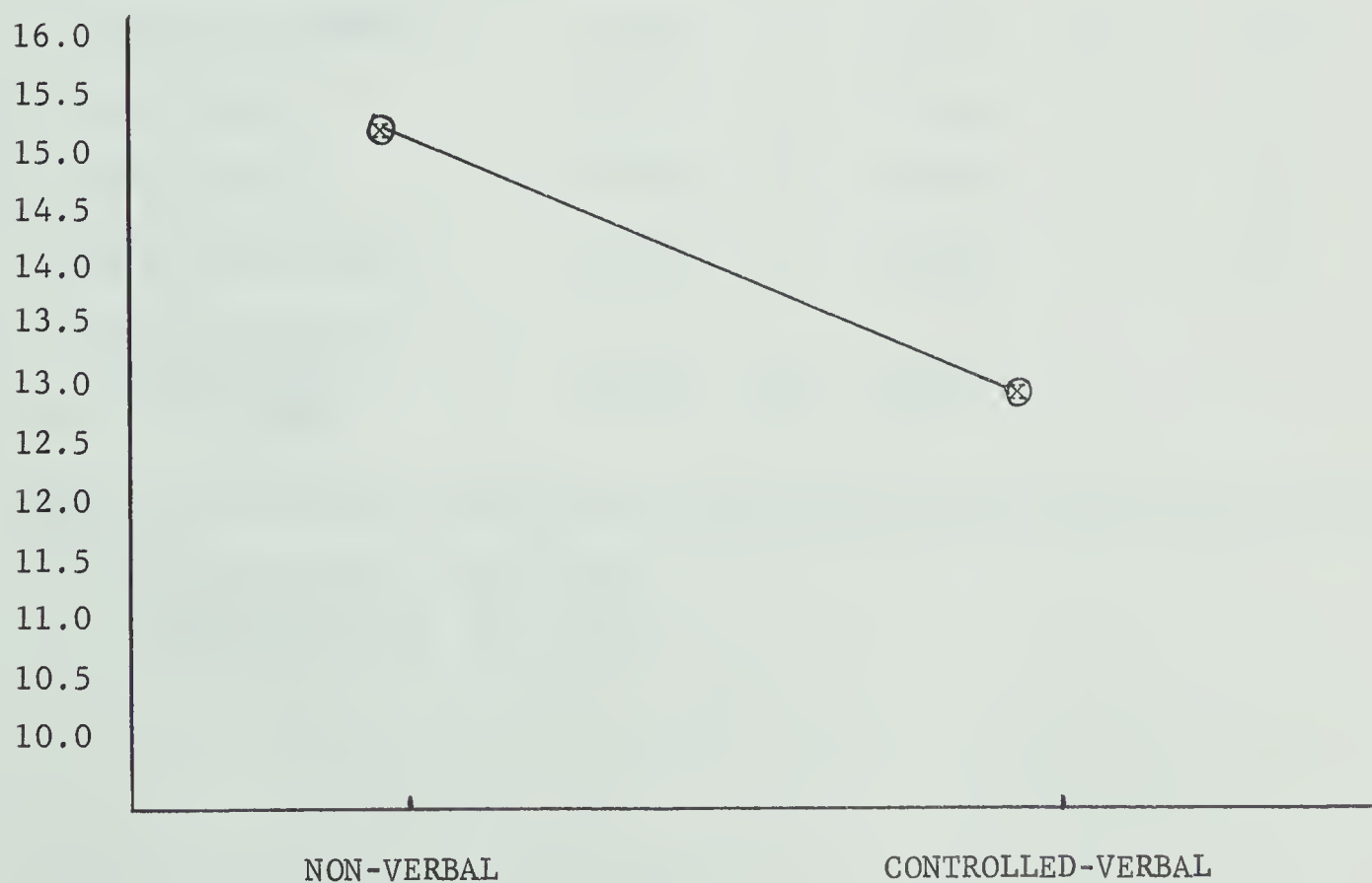


TABLE IV
SUMMARY OF ANALYSIS OF VARIANCE WHEN
CONSIDERING AGE, SEX AND TWO
MODES OF RESPONSE

SOURCE OF VARIATION	SS	DF	MS	F	P
BETWEEN SUBJECTS	.47396	59			
SEX	.13230	1	.13230	24.48	.000***
AGE	.36300	1	.36300	6.72	.012*
AGE X SEX	.26992	1	.26992	.50	.482
SUBJECTS WITHIN GROUPS (ERROR)	.30266	56	.54047		
WITHIN SUBJECTS	.35800	60			
MODE OF RESPONSE	.14083	1	.14083	44.01	.000***
SEX X MODE	.28035	1	.28035	8.76	.004**
AGE X MODE	.96328	1	.96328	3.01	.088
AGE X SEX X MODE	.30078	1	.30078	.09	.760
MODE X SUBJECTS WITHIN GROUP (ERROR)	.17919	56	.31999		

***Significant $< .001$ level.

**Significant at .005 level.

*Significant at .01 level.

TABLE V

SUMMARY OF ANALYSIS OF VARIANCE ON MEAN SCORES
FOR AGE GROUP I AND AGE GROUP II ON TWO
MODES OF RESPONSE

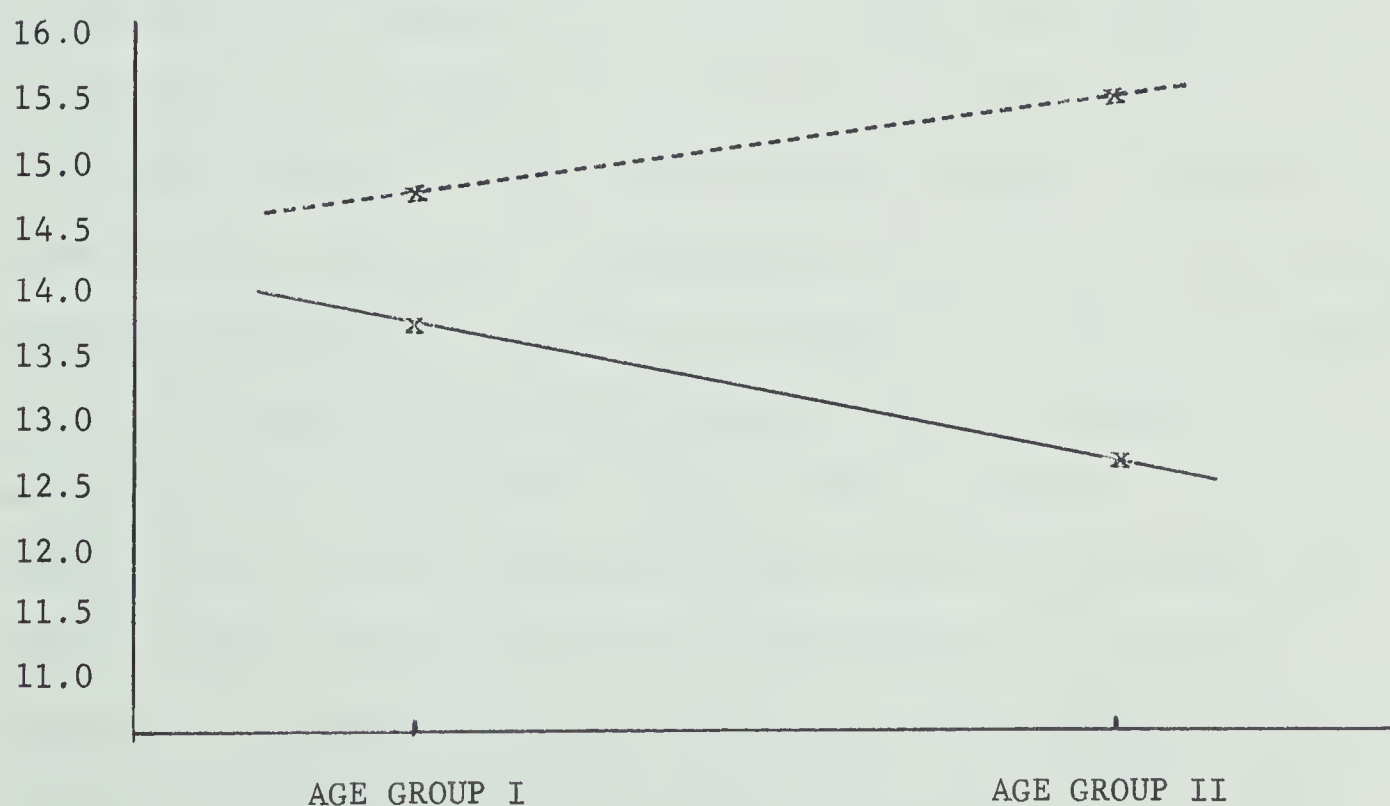
	MEANS N.V.	MEANS C.V.	S.D. N.V.	S.D. C.V.	DF	PROBABILITY OF t's FOR DIFFERENT MEANS
AGE GROUP I	14.83	13.76	2.63	2.27	28	.035**
AGE GROUP II	15.36	12.10	2.18	2.24	28	.000***

***Significant $< .001$ level.

**Significant at .05 level.

FIGURE II

EFFECT OF AGE GROUPS ON MODE OF RESPONSE



Mode of Representation:

----- NON-VERBAL (N.V.)

_____ CONTROLLED-VERBAL (C.V.)

at the .05 level and beyond the .001 level when the t-test for difference between means was used. The scores were recorded and plotted for each mode of response for the two age groups and are given in Figure II. It can be seen by Figure II that a larger discrepancy exists between the modes of response for age group II. The younger children scored lower on the Non-Verbal response than did the older children but higher on the Controlled-Verbal response than did the older children. These data indicate that a significant change occurs, with age, in children's ability to use prepositions of spatial position accurately. This change may be a reflection of the child's increasing awareness of the meanings of prepositions of spatial position and his attempt to use the verbal labels learned in a variety of situations.

In order to determine if the difference in scores for age group I and age group II, on each of two modes of response, were significant, a two-way analysis of variance was carried out. The first section of Table VI (p. 56) entitled "Age Groups" presents the mean differences in scores for each age group. The difference in mean scores on the Non-Verbal response for age group I (14.63) and age group II (13.50) were not significant. The indication is that children from both age groups scored equally well on the Non-Verbal response aspect of the test. It is interesting to note that the differences between scores for the Controlled-Verbal response for each age group is significant at the .05 level. Children in the younger age group scored significantly higher (.05 level) on this task (13.50) than did the older children (12.37). A possible explanation for this difference may be that younger children have learned the prepositions of spatial position in an imitative or modelling fashion.

TABLE VI
ANALYSIS OF VARIANCE BETWEEN AGE GROUP I AND
AGE GROUP II, MALES AND FEMALES, LSES^o AND
HSES, ON MEAN SCORES FOR EACH
MODE OF RESPONSE

AGE GROUPS

	MS-AGE I	MS-AGE II	SD-AGE I	SD-AGE II	DF	P
NON-VERBAL	14.63	15.57	2.64	2.19	58	.07
CONTROLLED-VERBAL	13.50	12.37	2.28	2.24	58	.03*

SEX GROUPS

	MS-MALE	MS-FEMALE	SD-M	SD-F	DF	P
NON-VERBAL	14.83	15.37	2.45	2.46	58	.20
CONTROLLED-VERBAL	12.10	13.77	1.81	2.49	58	.002**

SES GROUPS

	MS-LSES	MS-HSES	SD-LSES	SD-HSES	DF	P
NON-VERBAL	14.30	15.90	2.51	2.15	58	.005**
CONTROLLED-VERBAL	12.60	13.27	2.52	2.06	58	.137

**Significant at .005 level.

*Significant at .01 level.

^oLSES = low socio-economic status

HSES = high socio-economic status

The older children however, may be beginning to develop concepts of spatial position and are in the process of attaching labels to these concepts. Thus, they tend to experiment and over-generalize the use of the verbal label to specific situations.

The summary of analysis of variance presented in Table IV (p. 53) indicates that sex is a significant factor in determining scores achieved on the two modes of response examined. In light of the sex variable, the probability of children achieving these scores by chance was less than one in a thousand. In an attempt to account for this significance, the sex variable was divided into males and females and scores analyzed using a t-test for differences. The breakdown of the sex variable into males and females and their mean scores on each mode of response are given in Table VII (p. 58). Scores achieved by the males on the Non-Verbal (15.60) and Controlled-Verbal (13.0) response are significantly different beyond the .001 level. There was no significant difference between test scores for each mode of response for females. The data indicates that the mode of response is a significant factor for the males in determining scores achieved on the tests for prepositions of spatial position. This difference is illustrated graphically in Figure III.

The middle section of Table VI gives the results of a two-way analysis between males and females on each mode of response. The differences in test scores between males (14.83) and females (15.37) on the Non-Verbal response was significant at the .05 level. Females scored higher on both the Non-Verbal and Controlled-Verbal response aspects of the test, but significantly so (beyond the .001 level) on the Controlled-Verbal response. The findings indicate strongly that males have not

TABLE VII

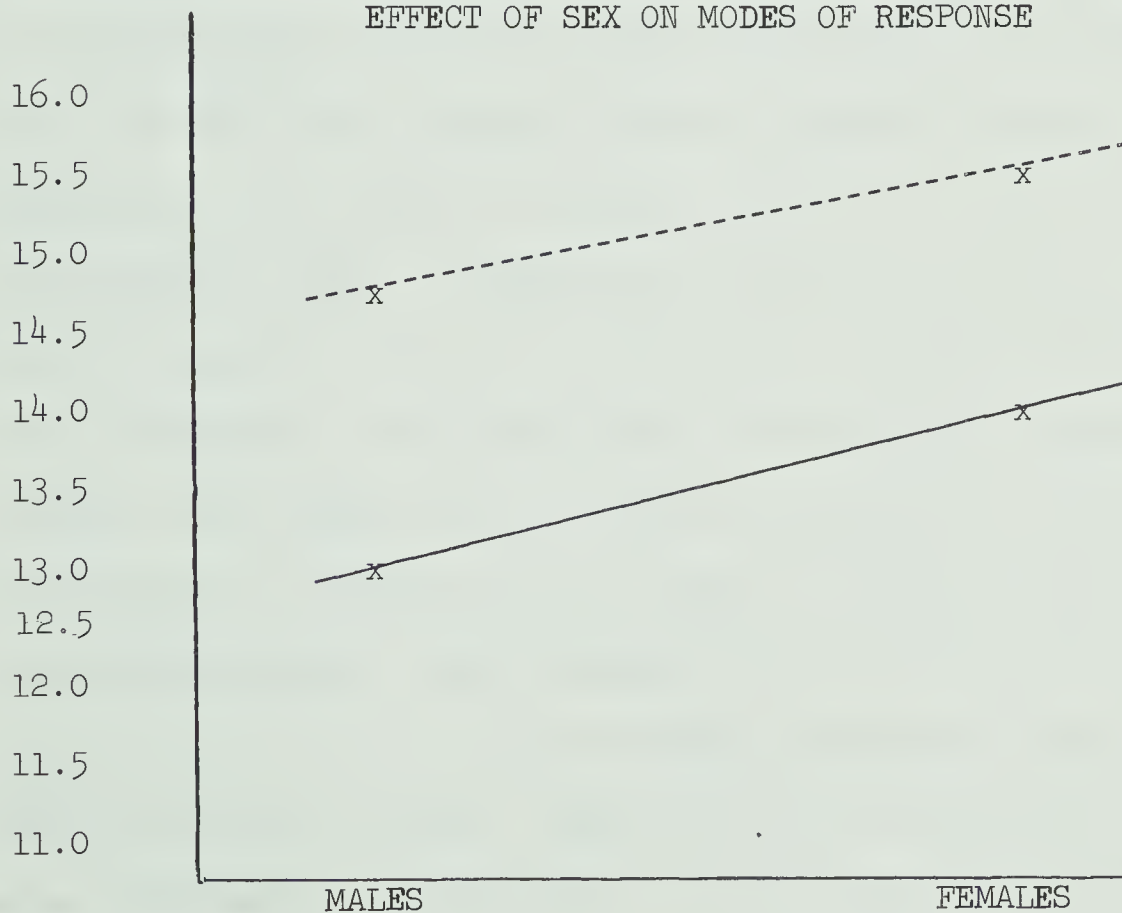
SUMMARY OF ANALYSIS OF VARIANCE ON MEAN SCORES
FOR MALES AND FEMALES ON TWO MODES OF RESPONSE

	MEANS N.V.	MEANS C.V.	S.D. N.V.	S.D. C.V.	DF	PROBABILITY OF t's FOR DIFFERENT MEANS
MALES	15.60	13.0	1.85	1.59	28	.000***
FEMALES	14.53	14.0	2.24	2.53	28	.495

*Significant .001 level.

FIGURE III

EFFECT OF SEX ON MODES OF RESPONSE



Mode of Representation:

----- NON-VERBAL (N.V.)
 _____ CONTROLLED-VERBAL (C.V.)

reached the same level of efficiency as that of the females in dealing with prepositions of spatial position.

A three-way analysis of variance was conducted to determine if there was an interaction between sex, socio-economic status and mode of response. Table VIII (P. 60) presents the findings of this analysis, and an examination of the table reveals that no interaction was evident among the variables.

Socio-economic status was indicated as a significant determiner (.001 level) of scores achieved. As was done previously with the age and sex variables, socio-economic status was examined in light of the two socio-economic groups considered in the sample. The differences in scores for the Non-Verbal (14.30 and 15.90) and the Controlled-Verbal (12.60 and 13.26) for each socio-economic group was analyzed using the t-test for differences. Table IX (p. 61) gives the levels of significance for each socio-economic group. A significant difference, at the .01 level, was found for subjects in the low socio-economic status group and a significant difference, at the .001 level, for subjects in the high socio-economic status group. Thus, a greater discrepancy exists among high socio-economic subjects on the two modes of response than for the low socio-economic group. This difference may be attributed to the subjects' relatively high score on the Non-Verbal response and lesser score on the Controlled-Verbal response. Figure IV (p. 61) illustrates these differences graphically. An examination of the figure shows that children from a high socio-economic status scored higher on both aspects of the test.

The last section of Table VI (p. 56) gives the results of a two-

TABLE VIII
SUMMARY OF ANALYSIS OF VARIANCE WHEN
CONSIDERING SEX, SES AND TWO
MODES OF RESPONSE

SOURCE OF VARIATION	SS	DF	MS	F	P
BETWEEN SUBJECTS	.47396	59			
SEX	.13230	1	.13230	24.48	.000***
SES	.38535	1	.38535	7.12	.009**
SEX X SES	.13281	1	.13281	.02	.876
SUBJECTS WITHIN GROUPS (ERROR)	.30300	56	.54107		
WITHIN SUBJECTS	.35800	60			
MODE OF RESPONSE	.14083	1	.14083	44.01	.000***
SEX X MODE	.28035	1	.28035	8.76	.004**
SES X MODE	.65312	1	.65312	2.00	.162
SEX X SES X MODE	.13281	1	.13281	.04	.840
MODE X SUBJECTS WITHIN GROUP (ERROR)	.18246	56	.32583		

***Significant at .05 level.

**Significant at .001 level.

TABLE IX

SUMMARY OF ANALYSIS OF VARIANCE ON MEAN SCORES
FOR LSES GROUP AND HSES GROUP ON TWO
MODES OF RESPONSE

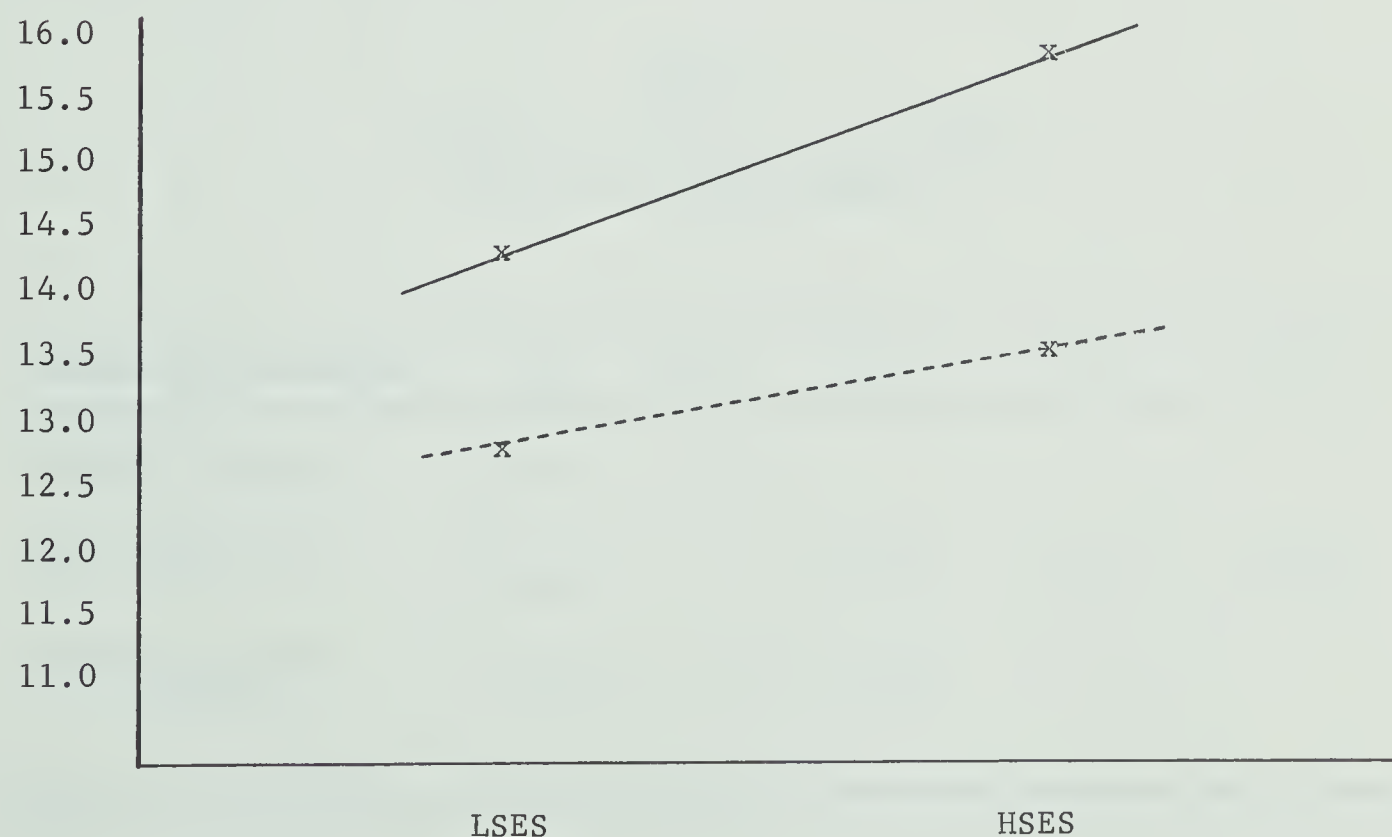
	MEANS N.V.	MEANS C.V.	S.D. N.V.	S.D. C.V.	DF	PROBABILITY OF t's FOR DIFFERENT MEANS
LSES	14.30	12.60	2.51	2.52	58	.005**
HSES	15.90	13.26	2.15	2.06	28	.000***

***Significant .001 level.

**Significant at .01 level.

FIGURE IV

EFFECT OF SES GROUPS ON TWO MODES OF RESPONSE



Mode of Representation:

———— NON-VERBAL (N.V.)

----- CONTROLLED-VERBAL (C.V.)

way analysis between mean scores of subjects from the low socio-economic status and high socio-economic status on each mode of response. An examination of Table VI shows that there was a significant difference between high socio-economic subjects' scores (14.30) and low socio-economic subjects' scores (12.60) on the Non-Verbal response. Children from the high socio-economic status scored higher on the Non-Verbal response than did their counterparts. There was no significant difference across socio-economic status for Controlled-Verbal response scores. Thus, children from high socio-economic status have acquired a better knowledge of prepositions of spatial positions on both aspects of the test, but significantly so on the Non-Verbal aspect.

Intelligence was considered as a variable affecting subject's responses on the two modes of response. Table X presents a summary of an analysis of variance for intelligence factors.

TABLE X
SUMMARY OF ANALYSIS OF VARIANCE
OF I.Q. ON TEST SCORES

SOURCE OF VARIATION	SS	DF	MS	F	P
BETWEEN SUBJECTS	161.609	13			
MAIN EFFECTS OF I.Q.	85.003	1	85.003	13.31	.003***
SUBJECTS WITHIN GROUPS	76.605	12	6.384		

Intelligence is a significant determiner of success on test items. The total population analyzed was small; fourteen subjects with an intelligence quotient of 120 or better and fourteen subjects with intelligence quotients of ninety-five or lower. Thus, the significance found may be due to the small sample utilized.

The analysis of variance for each mode of response considering the variables of age, sex, socio-economic status and intelligence have been described for the first two sections of the test. The data indicates that the mode of response affects children's ability to use and understand prepositions of spatial position. Children scored significantly higher on the Non-Verbal mode of response.

When the variables of age, sex and mode of response were considered an interaction between mode of response and sex was evident. A trend seems to be established in that scores of males were significantly higher on the Non-Verbal than Controlled-Verbal response. Male scores were not significantly below female scores on the Non-Verbal response section of the test, but very significantly below female scores on the Controlled-Verbal section. Thus, the data indicates that girls demonstrate a better understanding of prepositions of spatial position than do the boys in this sample.

The three-way analysis of variance indicated that there was a main effect for age. The differences in children's scores on each mode of response were significant when the two age groups were compared. A larger discrepancy appeared between the older age group than the younger, when both modes of response were considered. The older children scored higher on the Non-Verbal response but lower on the Controlled-Verbal response

than did the younger subjects. The main affect for age therefore appears to occur within the older age group.

Children from high socio-economic status scored higher on both aspects of the test than did children from the low-socio-economic status. Thus, a pattern seems to emerge which shows that socio-economic status affects the child's understanding of prepositions of spatial position. Children from a high socio-economic status had superior scores on both modes of response.

The variable of intelligence also effects children's performance on the test. Children with intelligence quotients of 120 or higher achieved better results than did the children with an intelligence quotient of 95 or lower. The sample population used indicated that children with high intelligence have a better understanding of prepositions of spatial position.

The following section will be devoted to a non-statistical analysis of children's responses on the Free-Verbal response section of the test.

II. ANALYSIS OF FREE-VERBAL RESPONSE SCORES

The Free-Verbal response aspect of the test was analyzed informally by the researchers. Each child's replies were analyzed and responses categorized under three sections; (1) correct response, (2) plausible response, and (3) incorrect response. The details of this analysis are given in Appendix C (p.112). Figure V represents the percentage of subject's responses under each category for the total population. Plausible and incorrect responses exceed the percentage of correct responses.

FIGURE V
ANALYSIS OF SUBJECTS RESPONSES
ON FREE-VERBAL RESPONSE FOR
TOTAL POPULATION

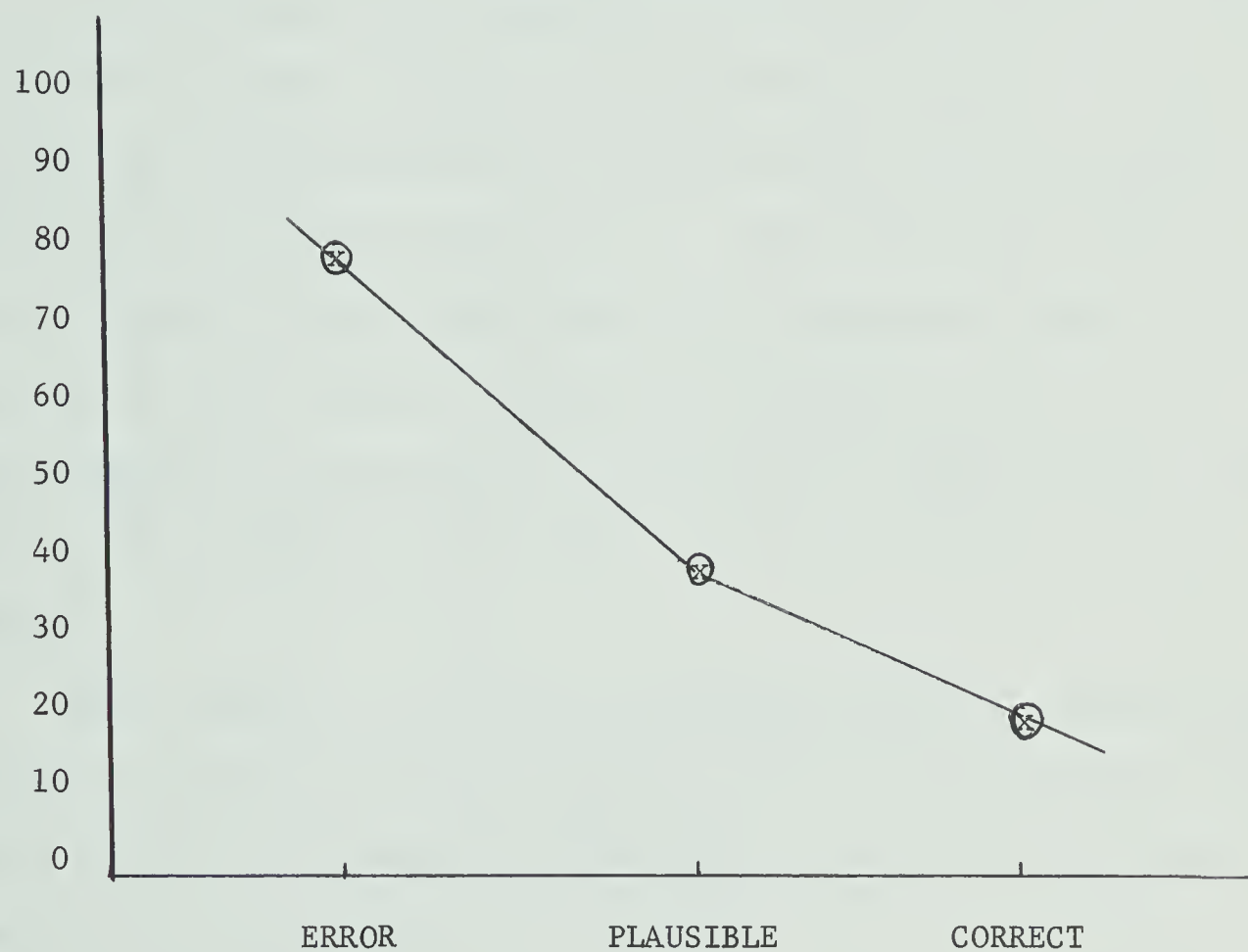


Figure VI represents an analysis of prepositions which were substituted by the subjects and categorized as plausible responses. The graph represents the frequency of the occurrence of plausible prepositions.

A close examination of Figure VI shows that the prepositions utilized were of a general or descriptive nature. It is interesting to note that only two prepositions of spatial position, "out" and "on", were given accurately by all the subjects.

The variables of age, sex and socio-economic status were examined in relation to scores achieved on the Free-Verbal response. Figures VII, VIII and IX plot the percentage of scores achieved for each category when considering the variables listed above. Upon examination of Table XI, it may be seen that there were only slight differences in mean scores achieved for each variable considered. Age group I tended to score a little higher than did subjects in age group II. Similar results were found on the Controlled-Verbal response when the variable of age was considered.

Girls tended to score higher on number of correct responses than did the boys. These findings concur with those discussed under the Non-Verbal and Controlled-Verbal response modes. Boys do not demonstrate the same level of comprehension as the females.

Children from the low socio-economic status scored slightly lower than did children from the high socio-economic status. These findings occurred in all three sections of the test.

Although there appears to be only slight differences in mean test scores achieved for each variable considered, it is interesting to note that these differences occur in the same direction; scores become lower

FIGURE VI

FREQUENCY DISTRIBUTION OF PLAUSIBLE
RESPONSES GIVEN ON THE
FREE-VERBAL RESPONSE

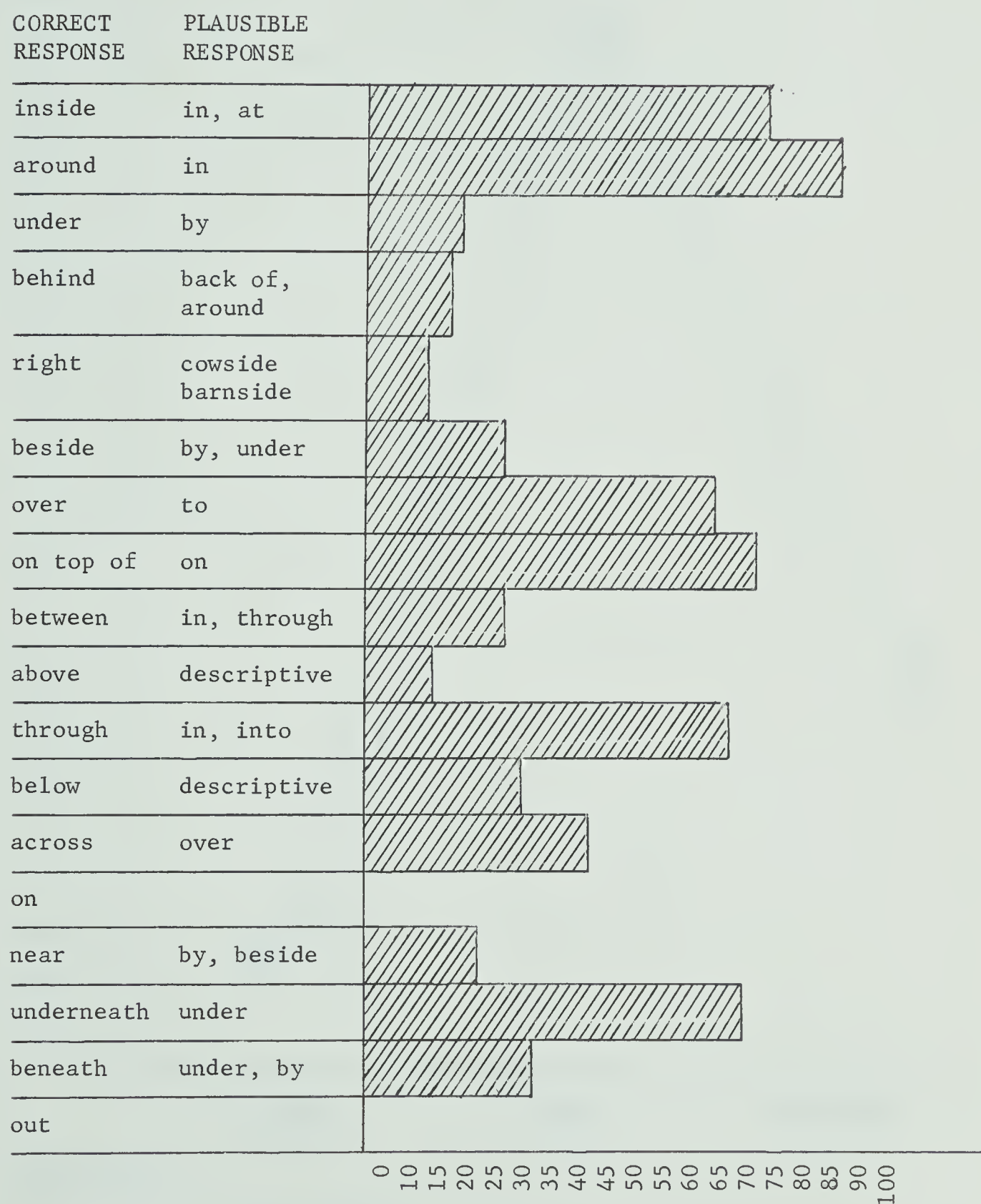
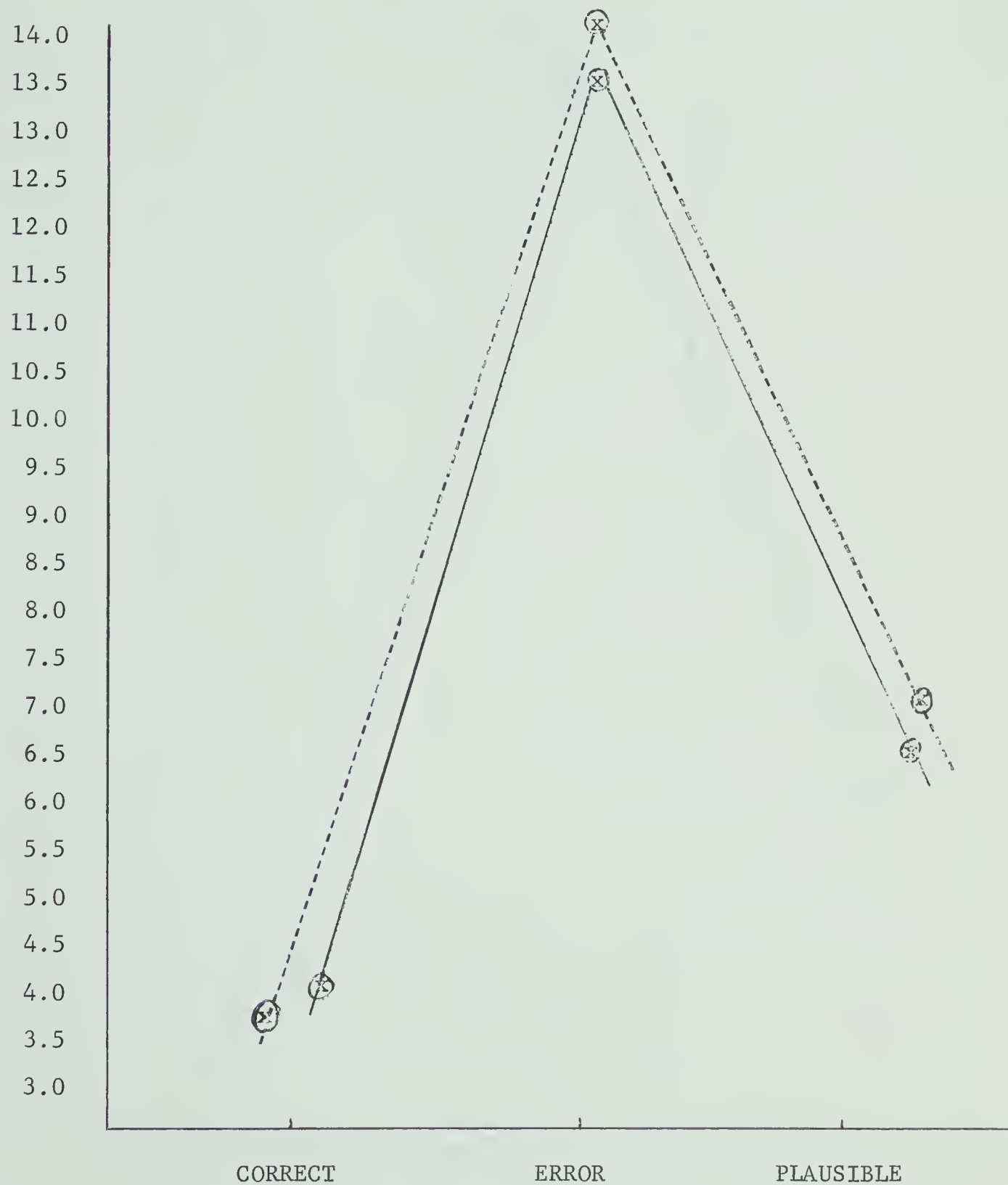


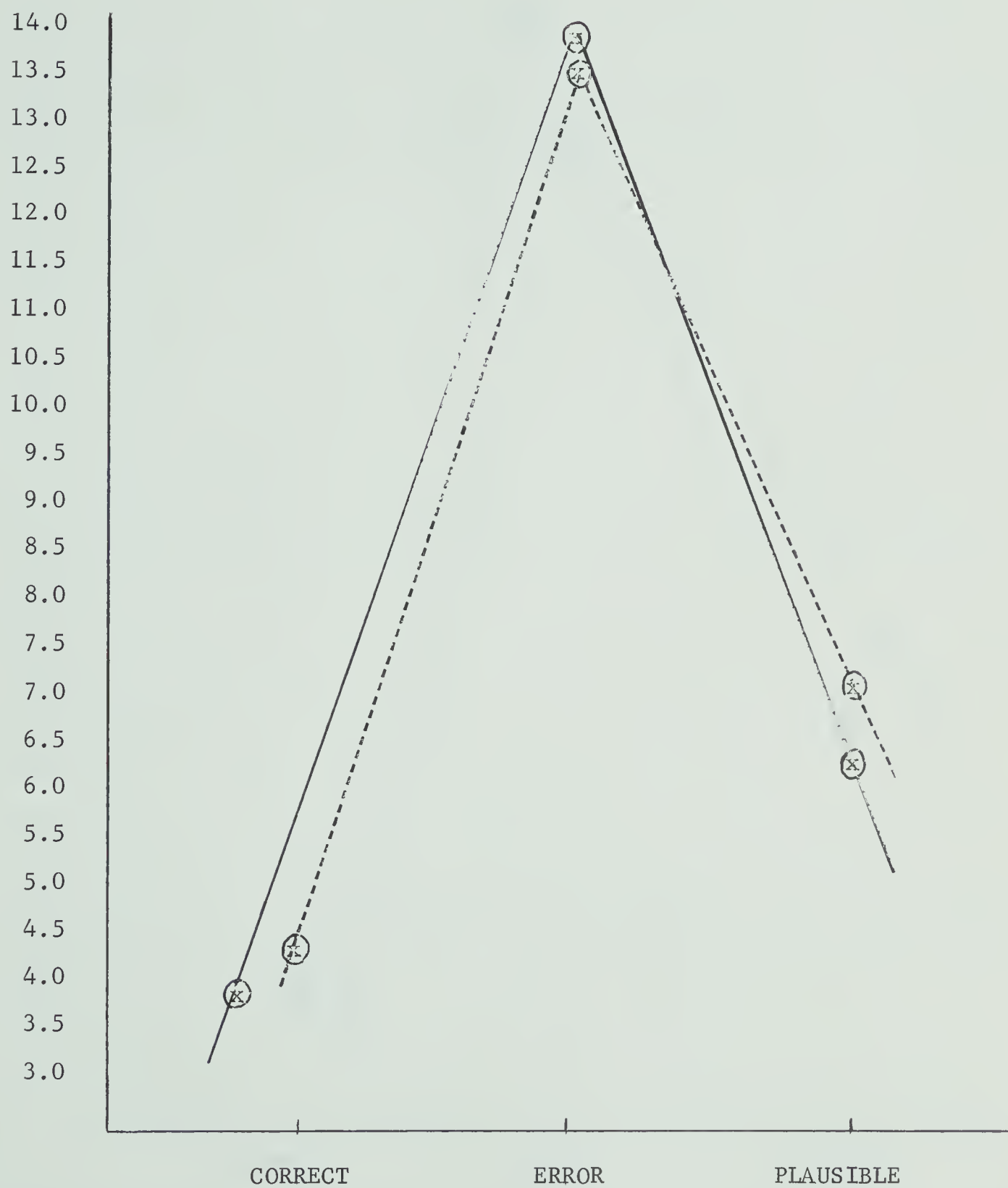
FIGURE VII

ANALYSIS OF VARIANCE OF AGE ON
FREE-VERBAL RESPONSE

AGE GROUPS:

————— AGE GROUP I
----- AGE GROUP II

FIGURE VIII
ANALYSIS OF VARIANCE OF SEX ON
FREE-VERBAL RESPONSE

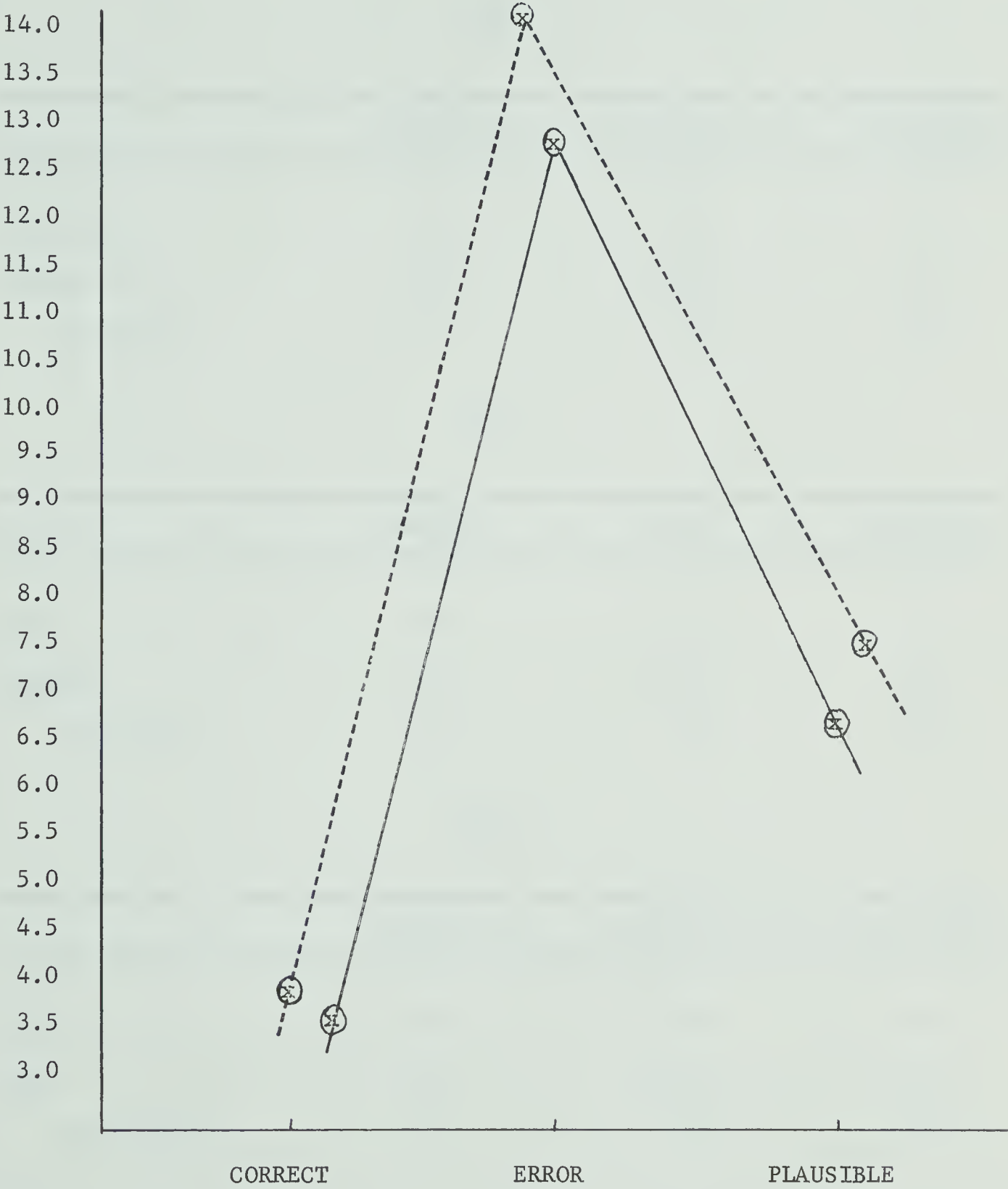


SEX:

———— MALES

----- FEMALES

FIGURE IX
ANALYSIS OF VARIANCE OF SES* ON
FREE-VERBAL RESPONSE



Socio-economic status: SES*

———— LSES

----- HSES

TABLE XI

MEAN SCORES OF SUBJECTS ON FREE-VERBAL RESPONSE WHEN
CONSIDERING THE VARIABLES: AGE, SEX AND SES

AGE

	CORRECT	ERROR	PLAUSIBLE
AGE GROUP I	4.16	13.83	7.06
AGE GROUP II	4.00	14.00	7.14
DIFFERENCE	.16	.17	.08

SEX

	CORRECT	ERROR	PLAUSIBLE
MALES	4.00	14.00	6.78
FEMALES	4.17	13.82	7.41
DIFFERENCE	.17	.18	.63

SES

	CORRECT	ERROR	PLAUSIBLE
LSES	3.96	13.08	6.83
HSES	4.20	14.03	7.40
DIFFERENCE	.24	.23	.57

on the Controlled-Verbal response than on the Non-Verbal response and lower on the Free-Verbal response than on the Controlled-Verbal response. The direction of these differences is illustrated in Figures VII, VIII and IX, by plotting the mean scores for each variable under consideration. The younger children scored higher on number of correct responses than did the older children but lower on mean number of plausible and incorrect responses. These results point to the possibility of younger children using imitative or adoptive language patterns. Older children made less correct responses but more plausible responses which may indicate their awareness of word meanings and their experimentation with their uses.

Figure VIII shows the distribution of mean scores, according to sex, for each category listed. Females scored higher on number of correct responses and plausible responses than did the males in the sample. These differences in scores are not significant but follow the same pattern found for males and females in the preceding sections of the test. Figure IX gives a graphical representation of mean scores plotted for each category of response for low and high socio-economic status groups. It can be seen from Figure IX that subjects from the high socio-economic status group obtained higher mean scores on all three categories of response than did the lower socio-economic group. Thus, socio-economic status influenced subjects' scores, on all sections of the test, in favour of those subjects from a high socio-economic status.

The analysis of variance on the Free-Verbal response section of the test concurs with the findings on the Non-Verbal and Controlled-Verbal response sections. That is, the older children's scores were below those of the younger children; male's scores were below those of female's and

subjects from a high socio-economic status obtained higher mean scores than their counterparts.

III. COMPARISON OF PREPOSITIONS OF SPATIAL POSITION ON THREE MODES OF RESPONSE

In order to compare the prepositions of spatial position which subjects understood, the percentages of correct responses for each preposition were plotted in Figure X. The eighty per cent level was selected by the researcher as the level of comprehension. This level was felt to be sufficiently high to limit responses which may have been given due to guessing. A close examination of Figure X reveals that only the preposition "out" was understood by subjects on all three modes of response. There tends to be a closer relationship between ability to use prepositions in the Non-Verbal and Controlled-Verbal response than in the Free-Verbal response. This indicates that children may have some working knowledge of prepositions of spatial position but do not use them in their speech.

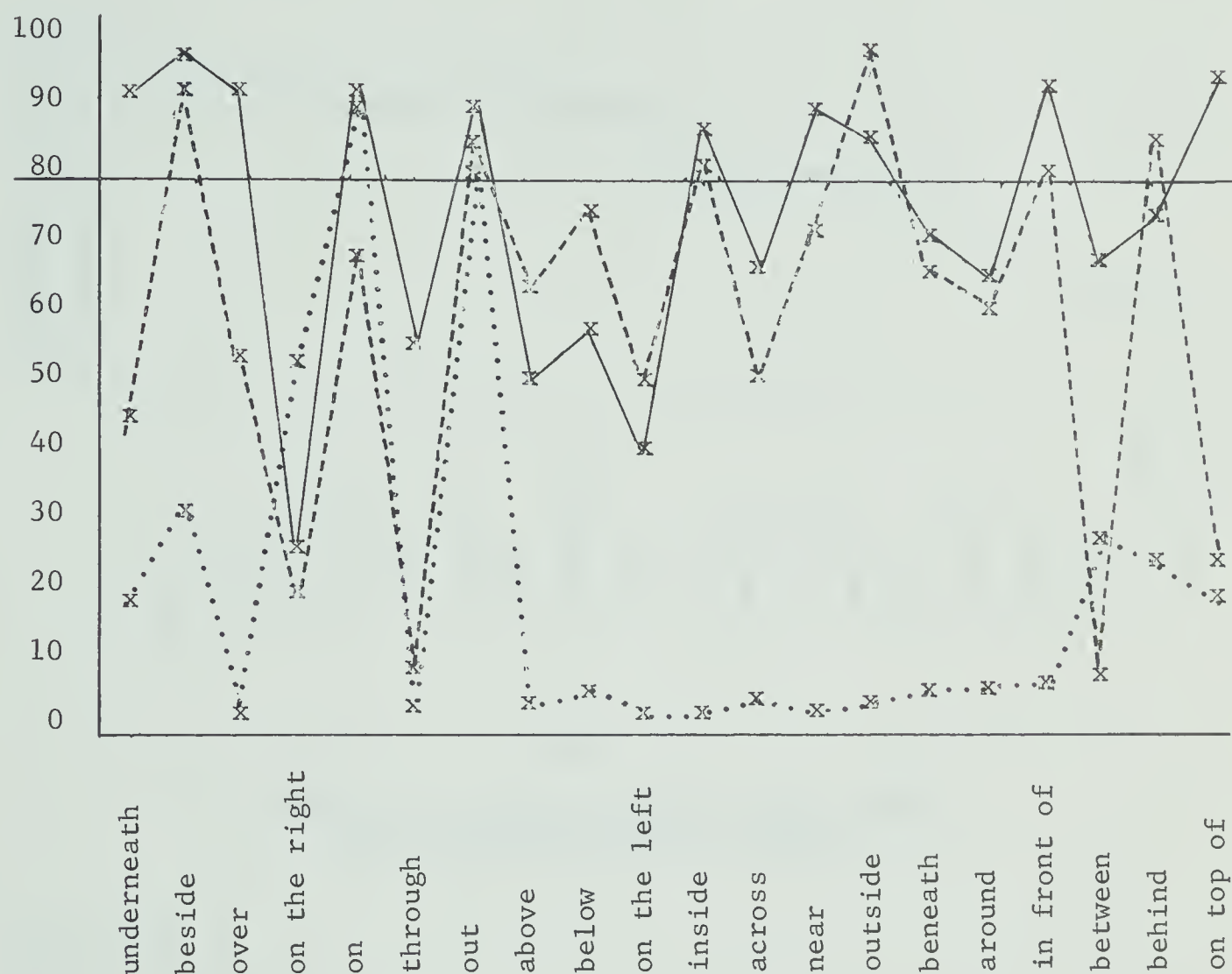
Prepositions which subjects understood in both the Non-Verbal and Controlled-Verbal response include the following:

1. beside
2. out
3. inside
4. outside
5. in front of

A look at Figures XI, XII, and XIII reveals that the percentage of prepositions which subjects understood altered with the mode of response. Ten prepositions of spatial position occurred beyond the eighty

FIGURE X

ANALYSIS OF PERCENTAGE OF CORRECT RESPONSES FOR EACH
PREPOSITION ON THREE MODES OF RESPONSE



Mode of Representation:

- _____ NON-VERBAL
 ----- CONTROLLED-VERBAL
 FREE-VERBAL

FIGURE XI

PERCENTAGE OF PREPOSITIONS SCORED CORRECT
FOR NON-VERBAL RESPONSE

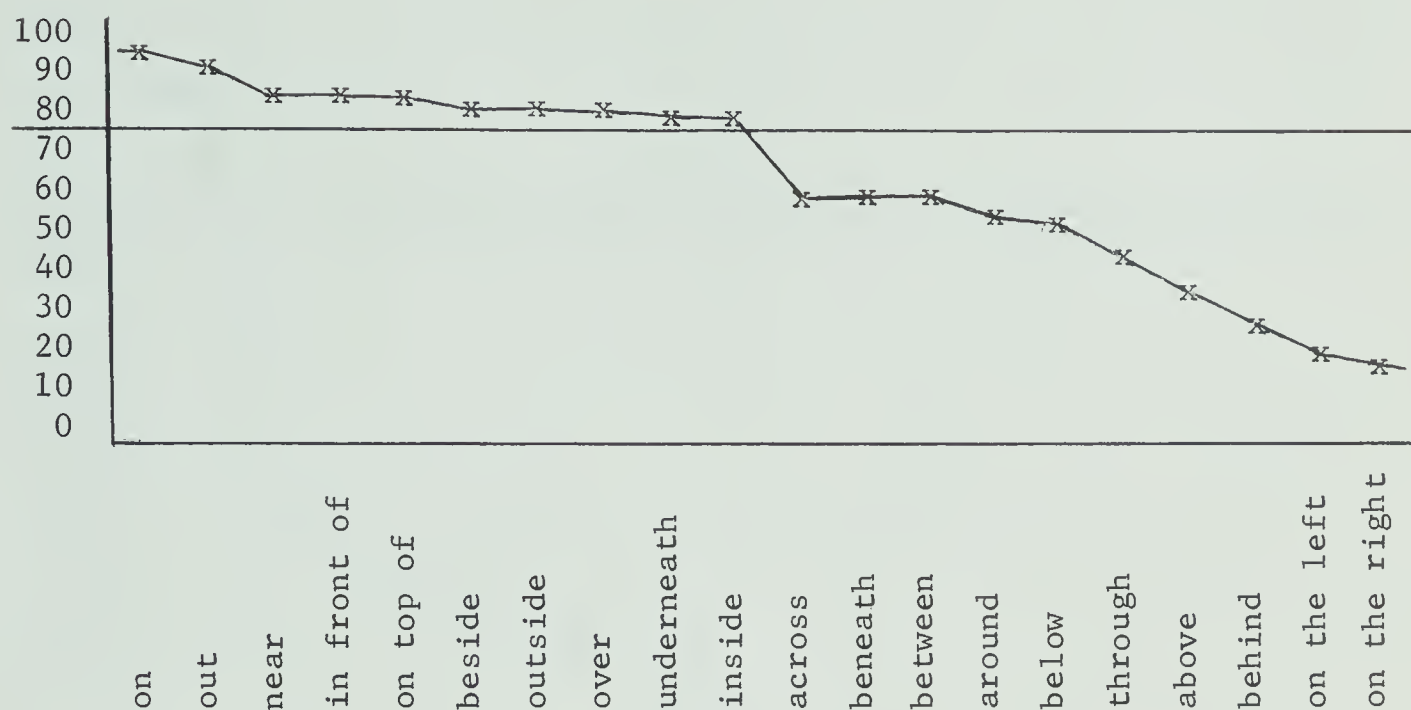


FIGURE XII

PERCENTAGE OF PREPOSITIONS SCORED CORRECT
FOR CONTROLLED-VERBAL RESPONSE

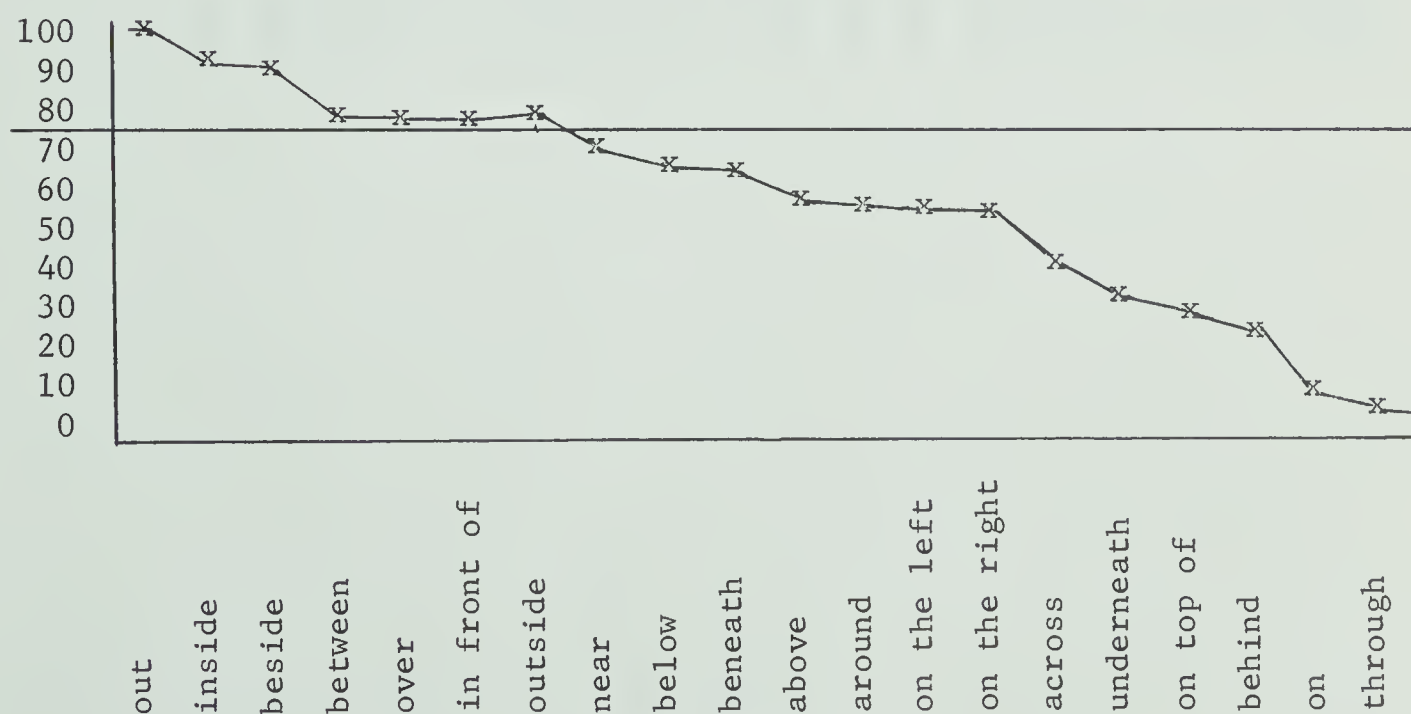
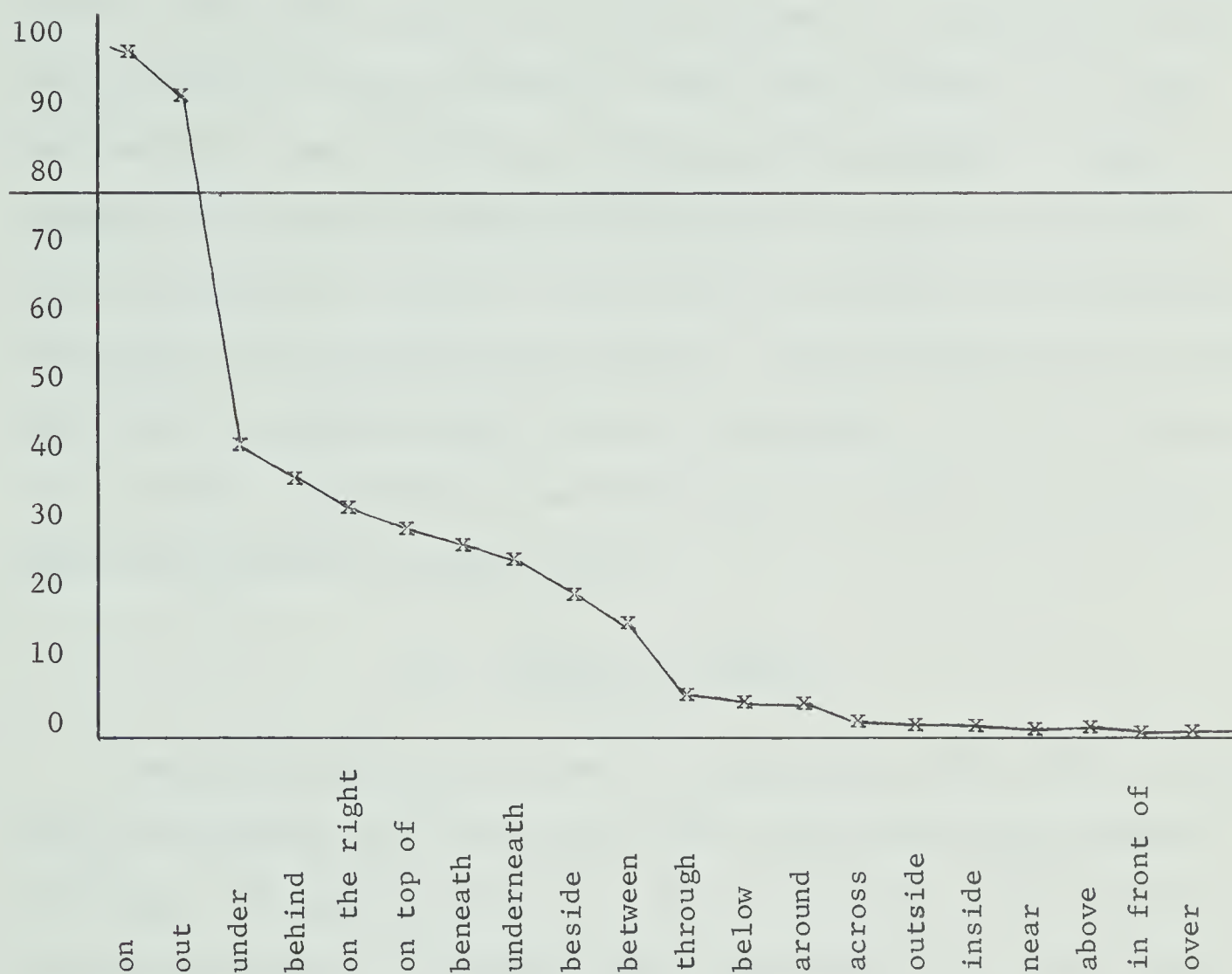


FIGURE XIII

PERCENTAGE OF PREPOSITIONS SCORED CORRECT
ON FREE-VERBAL RESPONSE



per cent level on the Non-Verbal response task, seven on the Controlled-Verbal response task and two on the Free-Verbal response task. Thus, it appears that the mode of response affects subjects scores for prepositions tested. Two possible reasons for this difference are suggested. Firstly, when the subjects were responding in a Non-Verbal situation, there may have been more cues available as to the possible placement of objects. Secondly, the Controlled-Verbal and Free-Verbal response required that the child supply the reasons or labels for the placement and subsequently the number of cues provided were reduced. In the Non-Verbal task the child could rely on a verbal mediator to solve the problem, such as the phrase, "on the fence". These verbal mediators were not available in the Controlled-Verbal and Free-Verbal response tasks.

IV. ADDITIONAL FINDINGS

During the testing situation, the experimenter made several interesting observations on the behavior of the children and their reactions to the test. It became apparent that the children were aware of implications of the words being tested after a few short trials. For example, if a child were asked to put the horse inside the barn, he would say "inside" or "outside" did you say?" Thus, the children became aware of the prepositions or prepositional phrases embedded in the sentences.

The children repeated the preposition or prepositional phrase being tested throughout the Non-Verbal response task. When given the direction "Put the sheep below the bird" the child would pick up the sheep and repeat out loud "below the bird, below the bird" as he moved around the model to make the placement. This phenomenon occurred frequently among

all subjects tested. The repetition behavior may have been a form of verbal mediation or used by the child as a means of assisting his memory.

During the Free-Verbal response testing, the researcher noted that the children tended to avoid a direct response for those prepositions they either did not know or were unsure about. For example, where the preposition required was "behind" in the sentence, "The farmer went _____ the barn," the child would mumble something and then say "the barn". This did not occur when the subject knew the preposition. Another example of a child avoiding the question was a remark similar to the following, "I just forget that word. What is it again?"

These findings, based on the observation of the children by the researcher, provide additional information about the subjects' reactions to, and performance on, the test.

V. SUMMARY

This chapter has presented the data from a study of kindergarten children's understanding of prepositions of spatial position. Variables which were examined for their effect on subjects' scores were considered and discussed. Age, sex and socio-economic status were found to influence children's scores on all modes of response. Younger children appear to obtain higher scores than the older children on the Controlled-Verbal and Free-Verbal response tasks. Socio-economic status influenced the scores achieved on all sections of the test showing that children from the higher socio-economic status were able to obtain higher scores. The females appear to score above the males, particularly in the Controlled-Verbal and Free-Verbal response aspects of the test. Intelligence was

found to influence a child's ability to grasp prepositions of spatial position when a small sample of the population was analyzed.

Scores were found to drop for each succeeding mode of response, with highest scores occurring in the Non-Verbal task and lowest scores in the Free-Verbal task.

Subject's scores were subjected to a three-way and two-way analysis of variance on the Controlled and Non-Verbal sections of the test. The findings have been presented in table and graph form to illustrate the relationships under discussion. Conclusions, implications and recommendations will be presented in the following chapter.

CHAPTER V

SUMMARY, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS FOR FURTHER RESEARCH

I. SUMMARY

The Design

The purpose of this study was to determine if kindergarten children understood prepositions of spatial position. Three modes of response were used to test the twenty spatial prepositions given; Non-Verbal response, Controlled-Verbal response and Free-Verbal response.

The population consisted of sixty kindergarten children selected on a random basis from eight kindergarten classrooms in the city of Regina. The sample was stratified to include equal numbers of subjects of the same age, sex and socio-economic status within each group. Socio-economic status scores were obtained by using a combination of the Blischen Occupational Scale (1961) and the revised Elley Gough Home Index Scale (1967).

The test of prepositions of spatial position was administered in two sections. Half of the population received the Non-Verbal and Controlled-Verbal response sections first while the remaining population received the Free-Verbal response section first. A time lapse of two weeks occurred between the testing sessions. All subjects were tested individually.

The subjects' scores on the Non-Verbal and Controlled-Verbal modes of response were analyzed using three statistical measures: three-way analysis of variance, two-way analysis of variance and correlated

t-test for differences between means and variance. A non-statistical analysis was conducted by the researcher on the Free-Verbal mode of response. Variables considered throughout were age, sex, socio-economic status, intelligence and mode of response.

II. CONCLUSIONS

The following hypotheses were posed:

Hypothesis I

There is no significant difference in children's scores between the Non-Verbal, Controlled-Verbal and Free-Verbal response.

The null hypothesis was rejected. The findings lead to the conclusion that children scored significantly higher on the Non-Verbal than on the Controlled-Verbal mode of response. These findings are similar to those found by Everett (1968:126) in which she stated "Subjects were more verbal, providing more correct responses, when defining the concrete phenomena."

Subjects were better able to display an understanding of prepositions of spatial position when using the Non-Verbal mode of response than when using the Controlled-Verbal response. These findings support Carroll's report that "comprehension level exceeds verbalization level in defining words," (Carroll, 1964:178).

The findings also indicate that subject's scores were higher on the Controlled-Verbal response than they were on the Free-Verbal response. Thus, children showed an ability to demonstrate a knowledge of prepositions of spatial position on the Controlled-Verbal task at a level superior to that which they were able to display when asked to use the

terms in describing the spatial position of an object in the Free-Verbal response.

Prepositions of spatial position which the children used throughout the Free-Verbal response section were found to be of a descriptive or general nature. McCarthy reports similar findings; "The child spontaneously makes combinations and gives them meaning by attaching them to particular experiences," (McCarthy, 1930:9).

The rejection of hypothesis one indicates that mode of response has an effect on children's ability to use prepositions of spatial position.

Hypothesis II: 1

There is no significant main effect for age, sex, socio-economic status and mode of response.

The above hypothesis was rejected. Age was found to be a significant determiner of children's responses on the Non-Verbal and Controlled-Verbal response modes, for each age group. However, there was no significant difference between Age Group I and Age Group II on the Non-Verbal response. Thus, the findings indicate that both age groups scored equally well on this mode of response. However, when the age variable was examined for the Controlled-Verbal response, a significant difference was found between the age groups in favour of the younger age group. This finding suggests that children's ability to use prepositions of spatial position undergoes a change with age and mode of response. A possible explanation for this might be that older children are no longer using language as an imitative process, but as their concepts of spatial position become clarified, begin to search for the matching linguistic

label. This finding is reported by Watts:

"The ability to think and talk of things remote in space or time is on the whole a later achievement. . . Children learn to narrate early (a sequence of things in the mind's eye). This sometimes means, of course, that they have merely acquired a service of words which they have drilled into order without any clear apprehension of what is meant by them," (Watts, 1957:72).

When subjects were asked to supply the preposition of spatial position in the Free-Verbal response section of the test, the younger children scored higher than did the children of the older age group. Once again, the findings indicate that a change occurs with age. As in the other two sections of the test, one may hypothesize that the older children are attempting to supply the precise linguistic label for the concept, rather than relying on a narrative or imitative language pattern learned earlier.

A main effect for sex was evident when the data was subjected to a statistical analysis. Males scored significantly lower on the Controlled-Verbal response than did the females. The findings were repeated when the Free-Verbal response was analyzed, that is, males scored below females. The Non-Verbal response mode did not require the use of language and no significant differences in test scores appeared among the sexes. It would seem that the differences are due to the linguistic development of boys and girls.

Several researchers (Luris, 1959, McCarthy, 1954, and Sigel, 1957) have found that sex differences occur in children's language development in favour of the girls. The findings of this study do not concur with Smith (1966) who states "girls are likely to begin the acquisition of a vocabulary at an earlier age than boys, but the sex difference is not

important after three years of age," (Smith, 1966:22). The findings of McCarthy (1930) when studying prepositions used by children ranging in ages from one and one half years to five years, revealed that no consistent sex differences appear in this part of speech as there are several reversals of the direction of the difference from one age level to the next," (McCarthy, 1930:117). However, the study did reveal that sex differences in favour of the girls were consistently in the same direction (when considering language ability on the whole) and appeared to surpass the boys up to the fifth or sixth year. The findings of this study indicate that the girls surpass the boys in explaining and using prepositions of spatial position.

A main effect for socio-economic status was found. In agreement with findings reported by Bernstein (1967), Brophy, Hess and Shipman (1965) and Reissman (Olsen, 1965) the findings indicated that children from the high socio-economic level scored consistently higher than did children from the lower socio-economic class. It is interesting to note that a significant difference occurred on the Non-Verbal response task. According to much of the literature, (Bernstein, 1967, Jensen, 1967, and Brophy, Hess and Shipman, 1965) children from low socio-economic stratas achieve better on tasks involving non-verbal stimuli. The findings of this study indicate that even while using the Non-Verbal mode of response, children from the lower socio-economic level scored lower than did children from the high socio-economic strata. Scores on the Controlled-Verbal response were not statistically significant when socio-economic status was considered. This finding indicates that while differences are not significant, they lie in the direction of

the high socio-economic subjects achieving higher scores. If one considers the mode of response, it indicates that all subjects score lower on the Controlled-Verbal and Free-Verbal response sections regardless of socio-economic status.

Intelligence was considered as a variable and found to be a significant factor in determining subject's scores on the test for prepositions of spatial position. Subjects whose intelligence quotients were 120 or above scored significantly higher than subjects whose intelligence quotients were 95 or below. Thus, intelligence is a predictor of success on test scores achieved for the test of prepositions of spatial position.

Hypothesis II: 2

There is no significant two-way interaction for:

- (a) age and mode of response
- (b) sex and mode of response
- (c) socio-economic status and mode of response
- (d) sex and age
- (e) socio-economic status and sex

Hypotheses (a), (b), (d) and (e) were accepted. There was a significant two-way interaction between sex and mode of response. Females performed at a superior level to the males in response to the Controlled-Verbal task while there was little difference in mean scores for males and females on the Non-Verbal task.

Hypothesis II: 3

There is no significant three-way interaction for:

- (a) sex, socio-economic status and mode of response
- (b) age, sex and mode of response

The above hypothesis was accepted in full. No significant three-way interaction was found among the variables tested.

III. GENERAL

The following general conclusions from the study appear to be valid:

1. The Non-Verbal response section of the test elicits greater conceptual and linguistic understanding than do the Controlled-Verbal and Free-Verbal response sections. It seems plausible to assume that more cues are available in the Non-Verbal section of the test than in the other two sections of the test.

2. The Controlled-Verbal section of the test elicits more correct responses than does the Free-Verbal response section. There appears to be a discrepancy between children's ability to understand prepositions of spatial position and their ability to explain the use of these terms precisely.

3. Subjects scored lowest on the Free-Verbal section of the test. This indicates that children do not use the correct prepositions of spatial position in their speech in order to describe the position of an object. As the children did not demonstrate a wide repertoire of prepositions of spatial position in their speech, a lack of competence in their use, as opposed to performance, is suggested.

4. Children do not use or understand all of the twenty prepositions of spatial position tested. Only one preposition of spatial position was given correctly for all three modes of response, the preposition 'out'. The number of prepositions used correctly declined with each mode of response with the greatest percentage correct occurring in the Non-Verbal section and the lowest percentage correct in the Free-Verbal response section.

5. Younger children score higher than older children on the Controlled-Verbal and Free-Verbal response tasks. Thus, there appears to be a slight shift with age in children's ability to use and understand prepositions of spatial position.

6. Males scored lower than females on all aspects of the test. The indication appears to be that girls have a superior knowledge of prepositions of spatial position than do boys.

7. Subjects from the high socio-economic stratas scored higher than subjects from the low socio-economic stratas, indicating that children from a high socio-economic background are better able to deal with prepositions of spatial position than are their counterparts.

8. Children with high intelligence have a superior grasp of spatial prepositions than children with low intelligence.

9. Children appear to repeat the prepositions as an aid to recalling the spatial position described by the linguistic label as was observed during the testing on the Free-Verbal response section.

10. Children tend to avoid giving a precise answer when in doubt as to the correct response. This was noted by the experimenter during the Free-Verbal response task and noted by the researcher.

IV. LIMITATIONS OF THE FINDINGS

As the test designed to determine children's understanding of prepositions of spatial position was being used for the first time, the extent of its validity and reliability may be questioned.

Scoring procedures utilized to determine the subject's comprehension of prepositions of spatial position were used in this study for

the first time. Thus, the possibility of receiving different results must be considered if another scoring device were utilized.

The population consisted of sixty kindergarten children and it is recognized that the results cannot be generated to include pre-school children.

Due to the small population involved, the effect of intelligence cannot be generated to include all subjects whose intelligence quotient falls within the ranges mentioned.

V. IMPLICATIONS OF THE FINDINGS

1. Children are able to understand prepositions of spatial position when they occur in the natural context. This may be due to the cues provided by the verbal direction and the context in which the prepositions occur. Educators of pre-school children must therefore be on guard against assuming that children fully understand the concept behind the verbal label. Children should be encouraged to explain and demonstrate the concepts implied in language in order to determine whether the child's concept and verbal label are synonymous.

2. As pre-school children do not appear to use the prepositions of spatial position in their speech, educators should provide opportunities for children to use these prepositions more accurately. Exercises making use of concrete materials in which the child is asked to tell the exact spatial position of an object should assist him in learning to use the verbal labels accurately.

3. As prepositions occur in the very early stages of the reading program, a portion of the reading readiness program should be devoted

to clarifying and building up the vocabulary of the child to include prepositions of spatial position.

4. Children from the low socio-economic areas should be provided with additional experiences with spatial position and help given with the terms describing the spatial position of an object.

5. Since girls appear to have a better mastery of prepositions of spatial position than do boys, educators should be aware of these differences in order to facilitate an understanding of pupil's verbal ability.

6. Throughout the Free-Verbal response section of the test, it was noted that children used verbal mediation or repetition for purposes of memory to assist them in solving the problem. As teachers of young children it is important to note that verbal mediation is an important aspect of the learning process. Therefore, young children should not be discouraged from speaking while attempting to solve a problem, but rather allowed to "think out loud". This information is valuable for the teacher in assisting her to understand the thought process which the child undergoes in finding a solution.

7. The fact that the children tended to avoid answering the question directly has implications for classroom teachers. The teacher must listen to a child's responses in order to determine if he understands the underlying concept. If a child is allowed to mumble a response or avoid the question in some other way, and is not asked to give an answer, he is learning to avoid thinking rather than being given the opportunity to clarify or reinforce his present knowledge.

8. The study has further shown that the mode of response in-

fluences the subjects' ability to demonstrate comprehension of specific terms. As educators, we must be on guard against imposing a mode of operation, due to the confinement of the classroom, on young children with which they are unable to cope. The classroom environment must allow for verbal, gestural and non-verbal responses by children.

VI. SUGGESTIONS FOR FURTHER RESEARCH

1. Due to the limited time available to the researcher, a small number (sixty) of subjects were included in the sample. A further study involving a larger sample population would provide a more adequate basis on which to draw conclusions.

2. Children used in the present study were five and six years of age. In order to determine whether the acquisition of prepositions of spatial position is a developmental process, a further study employing children from three to seven years of age would be beneficial. Such a study would enable the investigator to compare the use and comprehension of these prepositions as they occur at varying developmental stages.

3. An investigation, to discover whether the prepositions of spatial position may be acquired by children through systematic instruction, would provide information for educators regarding the teaching of this specific language skill. Two groups of children may be used, one acting as a control group and the other the experimental group receiving instruction over a reasonable period of time. The results of the groups tested at the end of the study, would provide some evidence as to whether the acquisition of prepositions of spatial position is

dependent upon maturation or experience.

4. As McCarthy (1930) has suggested, a study of children's language, over a long term period in their natural environment, would provide valuable information. Recording the child's use of prepositions of spatial position, the sequence in which they appear and the accuracy with which they are utilized presents an interesting and worthy project for future research.

5. Further research might be carried out using a more adequate sampling of intelligence quotient measures in order to refute or substantiate the findings of this study that intelligence affects the child's ability to understand and use prepositions of spatial position.

6. A study, similar to the one described here, utilizing a different scoring procedure would yield information as to the reliability of the information found regarding children's responses to the three modes of response described.

It is the hope of the researcher that the present study has provided information regarding one aspect of children's language development, which will lead to further investigations regarding children's knowledge and use of prepositions of spatial position.

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APPENDICES

APPENDIX A

THE LETTER TO PARENTS AND QUESTIONNAIRE FOR DETERMINING SOCIO-ECONOMIC STATUS

Dear Parents:

The enclosed forms are required for a research project attempting to study the development of language facility among kindergarten children. All information given will be processed by the computer; individual answers recorded are not revealed.

I am asking for your cooperation in filling out these forms and returning them in the enclosed envelope to the classroom teacher. Your assistance is appreciated.

Thank you,

QUESTIONNAIRE

1. Father's Occupation: _____

(Be clear: For example: Sales clerk at Eatons, door-to-door salesman for Fuller-Brush, travelling salesman for Massey-Ferguson)

2. Mother's Occupation: _____

(Either present employment or that held previous to home-making)

3. Do you ever use a language other than English in your home?

If you do, (a) Name it here: _____

(b) Circle the word which tells how often you use it:

HARDLY EVER

QUITE OFTEN

MOST OF THE TIME

DIRECTIONS: In the following questions, mark your answer by putting a circle in the right place. For example, in the question "Does your family own more than one car?" draw a circle around the "YES" if your family does own more than one car, and around the "NO" if it does not. Be sure to answer all questions.

1. Does your family own more than one car?..... Yes No
2. Does your family have a garage or carport?..... Yes No
3. Did the father of this family go to high school?..... Yes No
4. Did the mother of this family go to high school?..... Yes No
5. Did the father of this family go to university?..... Yes No
6. Did the mother of this family go to university?..... Yes No
7. Is there a desk in your home?..... Yes No
8. Do you have a combination stereo unit in your home?.... Yes No
9. Is there a piano or an electric organ in your home?.... Yes No
10. Is there a color TV in your home?..... Yes No
11. Does your family get a daily newspaper?..... Yes No
12. Does the child who brought this home have his (her)
own room at home?..... Yes No
13. Do you own your home?..... Yes No
14. Is there an encyclopedia in your home?..... Yes No
15. Are there more than 100 books in your home? (eg: 4
shelves: 3 feet long)..... Yes No
16. Does either parent in this home make regular use of
the Library? Yes No
17. Do you subscribe to one or more of the following
magazines?..... Yes No
 - A. Time
 - B. Newsweek
 - C. Saturday Night
 - D. Macleans
 - E. Readers Digest

- | | | | |
|-----|--|-----|----|
| 18. | Does your family leave town each year for a holiday?.. | Yes | No |
| 19. | Do you belong to any club where you have to pay fees?. | Yes | No |
| 20. | Does the mother of this family belong to any clubs
or organizations such as study, church, art or social
clubs?..... | Yes | No |
| 21. | Does the father of this family belong to any such
clubs or organizations?..... | Yes | No |
| 22. | Has the child who brought this home ever had lessons
in music, dancing, art, swimming, etc. outside of
school?..... | Yes | No |

APPENDIX B

TEST OF PREPOSITIONS OF SPATIAL POSITION

I. Non-Verbal Response

A sentence is repeated and the article mentioned in the sentence given to the child. The child places the article in the correct position. Credit is given only if the correct spacial position is indicated.

Sample Sentences

1. Put the horse inside the pasture.
2. Make the farmer jump into the wagon.

II. Controlled Verbal Response

The child is asked to answer the question with a "yes" or "no" response. If a "yes" response is given, the examiner replies "show me". If a "no" response is given, the examiner replies "Why do you think that _____ can not _____."

Sample Sentences

1. Can a horse go in the barn?
 "yes" Show me.
 "no" Why do you think the horse cannot go in the barn?

1. Non-Verbal

The child is told the sentence and given the article mentioned in the sentence. The child then puts it in the correct place and receives credit only if correct spacial position is indicated.

Sample Sentences

1. The duck is in the pond.
2. The farmer put the pail under the tractor.

Pause 15 seconds between questions.

One mark for each correct response.

1. Put the cow underneath the tree.
2. Put the tractor beside the barn.
3. Make the dog jump over the fence.
4. Put the rooster on the right of the henhouse (determine with child which is the front).
5. Put the rooster on the roof.
6. Make the cow go through the barn.
7. Take the pig out of the pen.
8. Put the bird above the door.
9. Put the sheep below the bird.
10. Put the car on the left of the house.
11. Put the horse inside the barn.
12. Make the horse walk across the yard.
13. Put the tractor near the shed.
14. Put the pig outside the pen.
15. Put the duck beneath the tree.
16. Make the duck swim around the pond.
17. Put the dog in front of the house.
18. Put the sheep between the trees.
19. Put the cow behind the machinery shed.
20. Put the bird on top of the chimney.

2. Verbal Questions

The child is required to answer the question by a "yes" or "no" reply. If the answer is "yes" examiner asks the child to show the position. Correct response requires explanation to satisfy the question, either by showing how or giving satisfactory reason for a negative reply.

Sample Question

1. Can a horse go in the barn?
Show me how - or Why not.

1. Can the cow walk around the yard?
2. Can the rooster walk in front of the henhouse?
3. Can a pig sit on top of the pen?
4. Can the pig walk through the pen?
5. What is above the pond? - show me.
6. What is beneath the tree? - show me.
7. What is on the left of the pond?
8. Can the cow stand beside the pond?
9. Can the duck sit on the barn?
10. Can the sheep walk across the water?
11. Can the dog walk between the pond?
12. What is below the roof of the machinery shed? - show me.
13. Can the pig go inside the henhouse?
14. Can the tractor run near the house?
15. Can the farmer sit underneath the henhouse?
16. Can the farmer stand behind the house?
17. Can the horse walk over the road?
18. What is on the right of the house?
19. Can the hen come outside of the henhouse?
20. Can the horse come out of the barn?

3. Free Verbal Response

The child is told the story, leaving out the prepositions of spacial position and asked to supply the missing word.
Examiner manipulates objects into positions.

Sample (Give until child understands direction)

1. The farmer got (on) the tractor.

Clancy was a curious pig. He wanted to see everything that went on at the farm. One morning Clancy walked out of the pen. He saw the duck swimming around the pond. The rooster sat under the tree.

Clancy saw the farmer go behind the barn. He was gone for a long time. Then he came around on the right side of the barn with a large box.

"What can that be?" thought Clancy. The farmer put the box down beside the tree. Then he walked away.

Clancy's curiosity had to be satisfied! He walked over to the box. He sat on top of the box. Nothing happened! He looked between the boards in the box but could see nothing.

"What can be in the box?" wondered Clancy. He could see the hayloft above the barn door. "Maybe there is something up there I can use to open the box", thought Clancy. He walked through the barn door and went in. He climbed the ladder up to the hayloft.

But then his troubles started. The farmer came and took the ladder away. How would he get down? He could see the pond, the trees, the cows below him. It looked so far down. He saw the bridge across the pond.

He saw Mr. Rooster sitting on the fence and called to him.

"Please help me get down!" called Clancy.

Mr. Rooster looked around the farm and saw a rope near the machine shed, underneath the tractor. He picked the rope up with his beak and flew to the hayloft.

Several animals were standing in front of the barn watching and told Clancy to throw one end of the rope down.

They tied it onto the haystack and pulled the rope down. "Get on the haystack and we'll lower you down," called the rooster.

As Clancy came down, the animals cheered. Then Clancy saw the farmer open the box. Inside was a baby chick. Now Clancy's curiosity was satisfied.

APPENDIX C

SCORING PROCEDURES FOR FREE-VERBAL
RESPONSE

SCORING PROCEDURES FOR FREE-VERBAL RESPONSE

Subjects' responses were recorded on the tape recorder, transcribed and analyzed. A sample transcript is included here with the scoring procedures used.

Three means of scoring the child's responses were used: correct, incorrect and plausible. Where the response was scored as plausible, the subject's responses were recorded and the number and nature of these responses calculated.

1010 FREE-VERBAL RESPONSE

MISS MCLEOD: Clancy was a curious pig. He wanted to see everything that went on at the farm. One morning Clancy walked (?) of the pen. (out)

RESPONSE: HE WALKED OUT OF THE PEN. (correct)

MISS MCLEOD: He could see the horse (?) the pasture. (inside)

RESPONSE: OVER THERE.

MISS MCLEOD: Where could he see the horse?

RESPONSE: HE COULD SEE THROUGH THE FENCE. (plausible)

MISS MCLEOD: Through the fence the pasture. He saw the duck swimming (?) the pond. (around)

RESPONSE: IN THE POND. (plausible)

MISS MCLEOD: Mr. Rooster sat-- (under)

RESPONSE: UNDER THE TREE. (correct)

MISS MCLEOD: Clancy saw the farmer go (?) the barn. (behind)

RESPONSE: IN THE BARN. (incorrect)

MISS MCLEOD: He was gone for a long time and then he came around on the (?) side of the barn. Which side? (right)

RESPONSE: LEFT. (incorrect)

MISS MCLEOD: Left side carrying a large box. What can that be, thought Clancy. The farmer put the box down (?) the tree. Where did he put it? (beside)

RESPONSE: DOWN NEAR THE TREE. (plausible)

MISS MCLEOD: And then he walked away. Clancy's curiosity had to be satisfied. He walked (?) to the box. He walked-- (over)

RESPONSE: HE WALKED TO THE BOX. (plausible)

MISS MCLEOD: He sat-- (on top of)

RESPONSE: ON THE BOX. (plausible)

MISS MCLEOD: Nothing happened. He looked (?) the boards in the box. Where did he look? (between)

RESPONSE: HE LOOKED IN THE BOARDS. (incorrect)

MISS MCLEOD: He looked in the boards in the box, but he couldn't see anything. What can be in the box, wondered Clancy. He could see the hayloft (?) him. Where could he see the hayloft? (above)

RESPONSE: HE LOOKED UP THERE.

MISS MCLEOD: Where could he see it then?

RESPONSE: HE COULD SEE IT UP THERE. (plausible)

MISS MCLEOD: Maybe there's something up there that I can use to open the box, thought Clancy. He walked (?) the barn door. Where did he walk? (through)

RESPONSE: HE WALKED INTO THE BARN. (plausible)

MISS MCLEOD: Into the barn door and climbed the ladder up to the hayloft, but then his troubles began. The farmer came and took the ladder away. How would Clancy get down? He could see the cows and the trees and the pond--somewhere him. Where could he see all those things? (below)

RESPONSE: HE SAW THEM FROM UP IN THE HAYLOFT. (plausible)

MISS MCLEOD: It looked a long way down. He saw the bridge (?) the pond. (across)

RESPONSE: OVER THE POND. (plausible)

MISS MCLEOD: He saw Mr. Rooster sitting--(?) the fence. (on)

RESPONSE: ON THE FENCE. (correct)

MISS MCLEOD: And called to him. "Please help me get down," called Clancy. Mr. Rooster looked around the farm and then he saw a rope (?) the machine shed. Where did he see the rope? (near)

RESPONSE: UNDER THE TRACTOR. (plausible)

MISS MCLEOD: Under the tractor--Where the machine shed?

RESPONSE: RIGHT THERE. (incorrect)

MISS MCLEOD: Can you tell me without pointing?

RESPONSE: IT WAS OVER ON THE SIDE OF THE BARN. (plausible)

MISS MCLEOD: On the side of the machine shed. He picked the rope up in his beak and flew to the hayloft. Several animals were watching and told Clancy to throw one end of the rope down. They tied it on to the haystack and pulled the rope-- (up)

RESPONSE: JUST PULLED IT UP. (correct)

MISS MCLEOD: "Get on the haystack and we'll lower you down," called the rooster. As Clancy came down the animals cheered. Then Clancy saw the farmer open the box. Inside was a baby chick. Now Clancy's curiosity was satisfied.

Total Correct Responses = 4

Total Plausible Responses = 11

Total Incorrect Responses = 4

APPENDIX D

SAMPLES OF SUBJECTS' RESPONSES ON
FREE-VERBAL RESPONSE SECTION

MALE, AGE GROUP I, LSES

1017 FREE VERBAL RESPONSE

MISS MCLEOD: Clancy was a curious pig. He wanted to know everything that went on at the farm. One morning Clancy walked (?) the pen. Where did he walk?

RESPONSE: OUT OF THE PEN.

MISS MCLEOD: He could see the horse (?) the pasture. Where?

RESPONSE: IN THE PASTURE.

MISS MCLEOD: He saw the duck swimming (?) the pond.

RESPONSE: HE SEEN THE DUCK SWIMMING IN THE POND.

MISS MCLEOD: The rooster was sitting (?) the tree.

RESPONSE: THE ROOSTER WAS SITTING UNDERNEATH THE TREE.

MISS MCLEOD: Clancy saw the farmer go (?) the barn. Where did he go?

RESPONSE: INTO THE BARN.

MISS MCLEOD: He was gone for a long time and then he came around on the (?) side. Which side did he come around on?

RESPONSE: THE FARMER CAME AROUND ON THE LEFT SIDE.

MISS MCLEOD: On the left side carrying a large box. What can be in the box, thought Clancy. The farmer put the box down (?) the tree. Where did he put it down?

RESPONSE: UNDERNEATH THE TREE.

MISS MCLEOD: And then he walked away. Clancy's curiosity had to be satisfied. He walked (?) the box. Where did he walk?

RESPONSE: HE WALKED OVER TO THE BOX.

MISS MCLEOD: He sat--

RESPONSE: ON THE BOX.

MISS MCLEOD: Nothing happened. He looked (?) the boards in the box, but could see nothing. Where did he look?

RESPONSE: ON THE BOARDS IN THE BOX.

MISS MCLEOD: What can be in the box, wondered Clancy. He could see the hayloft (?) him. Where could he see the hayloft?

RESPONSE: ON THE LEFT SIDE.

MISS MCLEOD: On the left side of him. Maybe there's something up there that I can use to open the box, thought Clancy. He walked (?) the barn door.

RESPONSE: HE WALKED INTO THE BARN DOOR.

MISS MCLEOD: And climbed the ladder up to the hayloft, but then his troubles began. The farmer came and took the ladder away. How would Clancy get down? He could see the pond, the cows, and the trees--somewhere him. Where could he see all those things?

RESPONSE: UP ON THE HAYLOFT.

MISS MCLEOD: It looked so far down. He could see the bridge (?) the pond.

RESPONSE: HE COULD SEE THE BRIDGE IN THE POND.

MISS MCLEOD: He saw Mr. Rooster sitting--

RESPONSE: ON THE FENCE.

MISS MCLEOD: And called to him. "Please help me get down," called Clancy. Mr. Rooster looked around the farm and saw a rope (?) the machine shed. Where did he see the rope?

RESPONSE: RIGHT THERE.

MISS MCLEOD: Can you tell me without pointing? Where did he see the rope?

RESPONSE: HE SEEN THE ROPE UNDERNEATH THE TRACTOR.

MISS MCLEOD: Underneath the tractor--where was it the machine shed?

RESPONSE: IT'S THERE--THAT IS WHERE THE ROPE IS.

MISS MCLEOD: The rooster picked the rope up in his beak and flew to the hayloft. Several animals were watching and told Clancy to throw one end of the rope down. They tied it on to the haystack and pulled the rope--

RESPONSE: AND THEY PULLED THE ROPE DOWN TO THE GROUND.

MISS MCLEOD: "Get on the haystack and we'll lower you down," called the rooster. As Clancy came down the animals cheered. Then Clancy saw the farmer open the box. Inside was a baby chick. Now Clancy's curiosity was satisfied.

FEMALE, AGE GROUP I, LSES

3008 FREE VERBAL RESPONSE

MISS MCLEOD: Clancy was a curious pig. He wanted to see everything that went on at the farm. One morning Clancy walked (?) the pen.

RESPONSE: OUT OF THE PEN.

MISS MCLEOD: He saw the horse (?) the pasture.

RESPONSE: IN THE PASTURE.

MISS MCLEOD: He saw the duck swimming--

RESPONSE: IN THE WATER.

MISS MCLEOD: The rooster saw (?) the tree.

RESPONSE: SAT BESIDE THE TREE.

MISS MCLEOD: Clancy saw the farmer go (?) the barn. Where did he go?

RESPONSE: BEHIND THE BARN.

MISS MCLEOD: He was gone for a long time and then he came around on the --which--side of the barn? Which side of the barn did he come around on?

RESPONSE: CORRAL SIDE OF THE BARN.

MISS MCLEOD: The corral side of the barn with a large box. What can that be, thought Clancy. The farmer put the box down (?) the tree.

RESPONSE: UNDER THE TREE.

MISS MCLEOD: And then he walked away. Clancy's curiosity had to be satisfied. He walked to the box. Where did he walk? Clancy walked--

RESPONSE: TO THE BOX.

MISS MCLEOD: He sat--

RESPONSE: ON TOP OF THE BOX.

MISS MCLEOD: Nothing happened. He looked (?) the boards but could see nothing. Where did he look?

RESPONSE: THROUGH THE BOARDS.

MISS MCLEOD: Through the boards but could see nothing. What can be in that box, wondered Clancy. He could see the hayloft (?) him. Where could he see it?

RESPONSE: IN THE BARN.

MISS MCLEOD: Maybe there's something up there I can use to open the box, thought Clancy. He walked (?) the barn door.

RESPONSE: INTO THE BARN.

MISS MCLEOD: And climbed the ladder up to the hayloft, but then his troubles began. The farmer came and took the ladder away. Poor Clancy. How could he get down? He could see the pond, the trees, and the cows--something--him?

RESPONSE: IN THE CORRAL.

MISS MCLEOD: It looked so far down. He could see the bridge (?) the pond.

RESPONSE: HE COULD SEE THE BRIDGE OVER THE POND.

MISS MCLEOD: He saw Mr. Rooster--

RESPONSE: ON THE FENCE.

MISS MCLEOD: "Please help me get down," called Clancy. Mr. Rooster looked around the farm and saw a rope (?) the machine shed. Where did he see the rope?

RESPONSE: UNDER THE TRACTOR.

MISS MCLEOD: Under the tractor--where the machine shed?

RESPONSE: ?

MISS MCLEOD: He picked the rope up with his beak and flew to the hayloft. Several animals were standing in front of the barn watching and told Clancy to throw one end of the rope down. They tied it on to the haystack and pulled the rope--

RESPONSE: THIS OTHER WAY--DOWN.

MISS MCLEOD: "Get on the haystack and we'll lower you down," called the rooster. As Clancy came down the animals cheered. Then Clancy saw the farmer open the box. Inside was a baby--

RESPONSE: CHICKEN.

MISS MCLEOD: Now Clancy's curiosity was satisfied.

MALE, AGE GROUP II, LSES

4014 FREE VERBAL RESPONSE

MISS MCLEOD: Clancy was a curious pig. He wanted to see everything that went on at the farm. One morning Clancy walked (?) the pen. Where did he walk?

RESPONSE: OUT OF THE PEN.

MISS MCLEOD: He saw the horse (?) the pasture.

RESPONSE: IN THE PASTURE.

MISS MCLEOD: He saw the duck swimming (?) the pond. Where is the duck swimming?

RESPONSE: IN THE POND.

MISS MCLEOD: He saw the rooster sitting--

RESPONSE: BESIDE THE TREE.

MISS MCLEOD: Clancy saw the farmer to (?) the barn. Where did he go?

RESPONSE: IN THE BARN.

MISS MCLEOD: He was gone for a long time and then he came around on the (?) side of the barn. Which side of the barn?

RESPONSE: THAT SIDE.

MISS MCLEOD: Can you tell me without pointing? Which side?

RESPONSE: WHERE ALL THE TREES ARE.

MISS MCLEOD: The side where the trees are?-carrying a large box. What can be in the box, wondered Clancy. The farmer put the box down (?) the tree.

RESPONSE: BESIDE THE TREE.

MISS MCLEOD: And then he walked away. Clancy's curiosity had to be satisfied. He walked (?) the box. Where did he walk?

RESPONSE: TO THE BOX.

MISS MCLEOD: He sat--

RESPONSE: ON IT.

MISS MCLEOD: Nothing happened. He looked (?) the boards in the box. Where did he look?

RESPONSE: IN THE BOX.

MISS MCLEOD: But he couldn't see anything. I wonder what's in the box, thought Clancy. He could see the hayloft (?) him. Where could he see the hayloft?

RESPONSE: ON TOP.

MISS MCLEOD: ON TOP OF HIM. Maybe there's something up there I can use to open the box, thought Clancy, so Clancy walked (?) the door.

RESPONSE: TO THE DOOR.

MISS MCLEOD: And climbed the ladder up to the hayloft, but then his troubles started. The farmer came and took the ladder away. How would Clancy get down? He could see the cows, the trees, and the pond--somewhere him. Where could he see all those things?

RESPONSE: IN THE POND.

MISS MCLEOD: It looked a long way down. He saw the bridge (?) the pond. Where did he see the bridge?

RESPONSE: ON TOP OF THE WATER.

MISS MCLEOD: On top of the pond? He saw the rooster sitting--

RESPONSE: ON THE FENCE.

MISS MCLEOD: And he called to him. "Please help me get down," called Clancy. The rooster looked around the farm and saw a rope (?) the machine shed.

RESPONSE: UNDER THE MACHINE.

MISS MCLEOD: Under the--

RESPONSE: TRACTOR.

MISS MCLEOD: Tractor--where the machine shed?

RESPONSE: RIGHT THERE.

MISS MCLEOD: He picked the rope up with his beak and flew to the hayloft. Several animals were watching and told Clancy to throw one end of the rope down. They tied it on to the haystack and pulled the rope--

RESPONSE: UP.

MISS MCLEOD: "Get on the haystack and we'll lower you down," called the rooster. As Clancy came down the animals cheered. Then Clancy saw the farmer open the box. Inside was a baby--

RESPONSE: DUCK.

MISS MCLEOD: Now Clancy's curiosity was satisfied.

FEMALE, AGE GROUP II, LSES

4044 FREE VERBAL RESPONSE

MISS MCLEOD: Clancy was a curious pig. He wanted to know everything that went on at the farm. One morning Clancy walked (?) the pen.

RESPONSE: OUT OF THE PEN.

MISS MCLEOD: He could see the horse (?) the pasture. Where?

RESPONSE: IN THE PASTURE.

MISS MCLEOD: He saw the duck swimming--

RESPONSE: IN THE WATER.

MISS MCLEOD: Mr. Rooster sat--

RESPONSE: UNDER THE TREE.

MISS MCLEOD: Clancy saw the farmer go (?) the barn. Where did he go?

RESPONSE: BEHIND THE BARN.

MISS MCLEOD: He was gone for a long time and then he came around on the (?) side of the barn. Which side?

RESPONSE: THE LEFT.

MISS MCLEOD: The left side of the barn carrying a large box. What can be in the box, wondered Clancy. The farmer put the box down (?) the tree.

RESPONSE: UNDERNEATH THE TREE.

MISS MCLEOD: And then he walked away. Clancy's curiosity had to be satisfied. He walked (?) the box.

RESPONSE: TO THE BOX.

MISS MCLEOD: He sat--

RESPONSE: ON THE BOX.

MISS MCLEOD: Nothing happened. He looked (?) the boards in the box. Where did he look?

RESPONSE: ON THE BOARDS IN THE BOX.

MISS MCLEOD: On the boards in the box but could see nothing. What can be in the box, wondered Clancy. He could see the hayloft--somewhere-him. Where could he see the hayloft?

RESPONSE: DOWN BESIDE THE BARN.

MISS MCLEOD: Down beside the barn him? Maybe there's something up there that I can use to open the box, thought Clancy. He walked (?) the barn door.

RESPONSE: HE WALKED IN THE BARN DOOR.

MISS MCLEOD: And climbed the ladder to the hayloft, but then his troubles started. The farmer came and took the ladder away. Poor Clancy. How would he get down? He could see the pond, the cows, and the trees--somewhere--him. Where could he see them?

RESPONSE: ON THE SIDE OF THE BARN.

MISS MCLEOD: On the side of the barn him? It looked a long way down. He saw the bridge (?) the pond. Where is the bridge?

RESPONSE: OVER WHERE THE WATER IS.

MISS MCLEOD: He saw the bridge over the pond. He saw Mr. Rooster sitting--

RESPONSE: ON THE FENCE.

MISS MCLEOD: And called to him. "Please help me get down," called Clancy. Mr. Rooster looked around the farm and saw a rope (?) the machine shed. Where is the rope?

RESPONSE: UNDERNEATH THE TRACTOR.

MISS MCLEOD: Underneath the tractor-where the machine shed?

RESPONSE: ?

MISS MCLEOD: Near the machine shed. The rooster picked up the rope in his beak and flew to the hayloft. Several animals were standing watching and told Clancy to throw one end of the rope down. They tied it on to the haystack and pulled the rope-- How did they pull the rope?

RESPONSE: PULLED IT DOWN.

MISS MCLEOD: "Get on the haystack and we'll lower you down," called the rooster. As Clancy came down the animals cheered. Then Clancy saw the farmer open the box. Inside was a baby duck. Now Clancy's curiosity was satisfied.

MALE, AGE GROUP I, HSES

1023 FREE VERBAL RESPONSE

MISS MCLEOD: Clancy was a curious pig. He wanted to see everything that went on at the farm. One morning Clancy walked (?) the pen. Where did he walk?

RESPONSE: OUT OF THE PEN.

MISS MCLEOD: He saw the horse (?) the pasture. Where?

RESPONSE: IN THE PASTURE.

MISS MCLEOD: He saw the duck swimming (?) the pond. Where was the duck swimming?

RESPONSE: HE SAW THE DUCK SWIMMING IN THE POND.

MISS MCLEOD: The rooster sat (?) the tree.

RESPONSE: THE ROOSTER SAT THE TREE.

MISS MCLEOD: Where?

RESPONSE: CLOSE TO THE PIG PEN.

MISS MCLEOD: Clancy saw the farmer go (?) the barn. Where did he go?

RESPONSE: BEHIND THE BARN.

MISS MCLEOD: He was gone for a long time and then he came around on the (?) side of the barn. Which side of the barn?

RESPONSE: RIGHT.

MISS MCLEOD: The right side of the barn carrying a large box. What can that be, thought Clancy. The farmer put the box down (?) the tree. Where did the farmer put the box down?

RESPONSE: IN THE PASTURE.

MISS MCLEOD: In the pasture the tree. And then he walked away. Clancy's curiosity had to be satisfied. He walked--

RESPONSE: INTO THE PASTURE.

MISS MCLEOD: Where--the box?

RESPONSE: WHERE THE BOX WAS.

MISS MCLEOD: He sat (?) the box.

RESPONSE: HE SAT ON THE BOX.

MISS MCLEOD: Nothing happened. He looked (?) the boards in the box. Where did he look?

RESPONSE: IN THE BOX.

MISS MCLEOD: In the boards in the box. He couldn't see anything. What can be in the box, wondered Clancy. He could see the hayloft (?) him. Where could he see the hayloft?

RESPONSE: UP IN THE BARN.

MISS MCLEOD: Up in the barn him? Maybe there's something up there that I can use to open the box, thought Clancy. He walked (?) the barn door.

RESPONSE: HE WALKED IN THE BARN DOOR.

MISS MCLEOD: And climbed the ladder to the hayloft, but then his troubles started. The farmer came and took the ladder away. How would Clancy get down? He could see the cows and the pond and the trees--somewhere him. Where could he see them?

RESPONSE: OUT OF THE WINDOW--I MEAN THE THING THAT KEEPS THE HAY IN.

MISS MCLEOD: The hayloft? It looked a long way down. He saw the bridge (?) the pond. Where did he see the bridge?

RESPONSE: FROM THE HAYLOFT.

MISS MCLEOD: Yes, but where is the bridge (?) the pond?

RESPOND: IN THE PASTURE.

MISS MCLEOD: He saw Mr. Rooster sitting--

RESPONSE: ON THE FENCE.

MISS MCLEOD: And called to him. "Please help me get down," cried Clancy. Mr. Rooster looked around the farm and saw a rope (?) the machine shed. Where is the rope?

RESPONSE: BY THE TRACTOR.

MISS MCLEOD: By the tractor--where the machine shed?

RESPONSE: BESIDE THE BARN.

MISS MCLEOD: He picked up the rope in his beak and flew to the hayloft. Several animals were standing around watching and told Clancy to throw one end of the rope down. They tied it on to the haystack and pulled the rope--

RESPONSE: UP TO THE HAYLOFT.

MISS MCLEOD: "Get on the haystack and we'll lower you down," called the rooster. As Clancy came down the animals cheered. Then Clancy saw the farmer open the box. Inside was a baby chicken. Now Clancy's curiosity was satisfied.

FEMALE, AGE GROUP I, HSES

1004 FREE VERBAL RESPONSE

MISS MCLEOD: Clancy was a curious pig. He wanted to know everything that went on at the farm. One morning Clancy walked (?) the pen. Where did he walk?

RESPONSE: HE WALKED OUT OF THE PEN.

MISS MCLEOD: He saw the horse (?) the pasture. Where did he see the horse?

RESPONSE: ?

MISS MCLEOD: He saw the duck swimming--

RESPONSE: IN THE POND.

MISS MCLEOD: Mr. Rooster was sitting--

RESPONSE: UNDER A TREE.

MISS MCLEOD: Clancy saw the farmer go (?) the barn. Where did he go?

RESPONSE: BEHIND THE BARN.

MISS MCLEOD: He was gone for a long time and then he came around on the (?) side of the barn. Where did he come?

RESPONSE: THE RIGHT.

MISS MCLEOD: The right side carrying a large box. What can be in the box, wondered Clancy. The farmer put the box down (?) where?

RESPONSE: UNDER THE TREE.

MISS MCLEOD: And then he walked away. Clancy's curiosity had to be satisfied. He walked (?) the box. Where did he walk?

RESPONSE: TO THE BOX.

MISS MCLEOD: He sat--

RESPONSE: ON THE BOX.

MISS MCLEOD: Nothing happened. He looked (?) the boards in the box. Where did he look?

RESPONSE: IN THE CRACKS.

MISS MCLEOD: In the cracks in the boards in the box, but he couldn't see anything. I wonder what's in the box, thought Clancy. He could see the hayloft (?) him. Where could he see the hayloft?

RESPONSE: THROUGH THE WINDOW.

MISS MCLEOD: Through the window? But look where he is? Where could he see the hayloft?

RESPONSE: BESIDE THE BARN.

MISS MCLEOD: Maybe there's something up there that I can use to open the box, thought Clancy. He walked (?) the barn door..

RESPONSE: IN THE BARN.

MISS MCLEOD: In the barn door and climbed the ladder up to the hayloft, but then his troubles started. The farmer came and took the ladder away. How could Clancy get down? He could see the cows, the trees, and the pond--somewhere him. Where could he see them?

RESPONSE: WAY UP BESIDE THE BARN.

MISS MCLEOD: It looked a long way down. He could see the bridge (?) the pond. Where is the bridge?

RESPONSE: IT'S OVER BY THE WATER.

MISS MCLEOD: Over the pond. He saw Mr. Rooster sitting--

RESPONSE: ON THE FENCE.

MISS MCLEOD: And called to him. "Please help me get down," cried Clancy. Mr. Rooter looked around the farm and saw a rope--somewhere the machine shed.

RESPONSE: BESIDE THE TRACTOR.

MISS MCLEOD: Beside the tractor--where the machine shed? Where is the rope?

RESPONSE: UNDER THE TRACTOR.

MISS MCLEOD: The rooster picked up the rope in his beak and flew to the hayloft. Several animals were watching and told Clancy to throw one end of the rope down. They tied it on to the haystack and pulled the rope--

RESPONSE: UP.

MISS MCLEOD: "Get on the haystack and we'll lower you down," called the rooster. As Clancy came down the animals cheered. Then Clancy saw the farmer open the box. Inside was a baby chicken. Now Clancy's curiosity was satisfied.

FEMALE, AGE GROUP II, HSES

1005 FREE VERBAL RESPONSE

MISS MCLEOD: Clancy was a curious pig. He wanted to see everything that went on at the farm. One morning Clancy walked--

RESPONSE: OUT.

MISS MCLEOD: Out of the pen. He saw the horse (?) the pasture. He saw the horse--where?

RESPONSE: IN THE BARN.

MISS MCLEOD: Was he in the barn? He saw the horse--in the pasture. He saw the ducks swimming (?) the pond.

RESPONSE: IN THE POND.

MISS MCLEOD: The rooster sat (?) the tree.

RESPONSE: BY THE TREE.

MISS MCLEOD: Clancy saw the farmer go (?) the barn. Where did the farmer go?

RESPONSE: IN THE BARN.

MISS MCLEOD: In the barn? He was gone for a long time and then he came around on the (?) side of the barn. Which side did the farmer come around on?

RESPONSE: RIGHT SIDE.

MISS MCLEOD: Carrying a very large box. The farmer put the box down (?) the tree. Where did he put it?

RESPONSE: BY THE TREE.

MISS MCLEOD: What can that be, thought Clancy. The farmer walked away. Clancy's curiosity had to be satisfied. He walked (?) the box. Where did he walk?

RESPONSE: IN THE GATE.

MISS MCLEOD: Where? He walked in the gate to the box. He sat--

RESPONSE: ON TOP OF THE BOX.

MISS MCLEOD: Nothing happened. He looked the cracks in the box.
He looked -- where?

RESPONSE: IN THE CRACKS.

MISS MCLEOD: But could see nothing. What can be in the box,
wondered Clancy. He could see the hayloft up (?).

RESPONSE: UP THERE ON THE RIGHT SIDE.

MISS MCLEOD: Maybe there's something up there I can use to open
the box, thought Clancy. He walked (?) the barn door.

RESPONSE: IN THE BARN.

MISS MCLEOD: In the barn door and went in. He climbed up the
ladder to the hayloft, but then Clancy's troubles
started. The farmer came and took the ladder away.
Poor Clancy. How could he get down? He could see the
pond, the trees, and the cows--somewhere--him. Where
could he see them?

RESPONSE: DOWN THERE.

MISS MCLEOD: It looked so far down. He saw the bridge (?) the pond.
He saw the bridge--where?

RESPONSE: ACROSS THE POND.

MISS MCLEOD: He saw Mr. Rooster sitting (?)

RESPONSE: ON THE FENCE.

MISS MCLEOD: And called to him. "Please help me get down," called
Clancy. Mr. Rooster looked all around the farm and
saw a rope (?) the machine shed. Where did he see the
rope?

RESPONSE: OVER THERE.

MISS MCLEOD: Where? He saw the rope (?) the machine shed.

RESPONSE: IN THE--

MISS MCLEOD: In the machine shed? He saw a rope in the machine shed (?) the tractor. Where is the rope?

RESPONSE: UNDER THE TRACTOR.

MISS MCLEOD: He picked the rope up with his beak and flew with it to the hayloft. Several animals were standing in front of the barn watching. They told Clancy to throw one end of the rope down. They tied it on to the haystack and pulled the rope -- Where did they pull the rope?

RESPONSE: DOWN.

MISS MCLEOD: "Get on the haystack and we'll lower you down," called the rooster. As Clancy came down the animals cheered, and then Clancy saw the farmer open the box. Inside was a baby --

RESPONSE: DUCK.

MISS MCLEOD: Now Clancy's curiosity was satisfied.

MALE, AGE GROUP II, HSES

2013 FREE VERBAL RESPONSE

MISS MCLEOD: Clancy was a curious pig. He wanted to see everything that went on at the farm. One morning Clancy walked (?) the pen.

RESPONSE: OVER THE PEN.

MISS MCLEOD: He saw the horse (?) the pasture.

RESPONSE: IN THE PASTURE.

MISS MCLEOD: He saw the duck swimming (?) the pond.

RESPONSE: IN THE POND.

MISS MCLEOD: The rooster sat (?) the tree.

RESPONSE: ON THE TREE.

MISS MCLEOD: Clancy saw the farmer go (?) the barn.

RESPONSE: IN THE BARN.

MISS MCLEOD: He was gone for a long time and then he came around on the (?) side of the barn.

RESPONSE: LEFT.

MISS MCLEOD: Left side of the barn carrying a big box. What can that be, thought Clancy. The farmer put the box down (?) the tree. Where did he put it?

RESPONSE: BESIDE THE TREE.

MISS MCLEOD: What can that be, thought Clancy, and then the farmer walked away. Clancy's curiosity had to be satisfied. He walked to the box.

RESPONSE: OVER TO THE BOX.

MISS MCLEOD: He sat--

RESPONSE: ON THE BOX.

MISS MCLEOD: Nothing happened. He looked (?) the boards in the box but could see nothing.

RESPONSE: AT THE BOARDS.

MISS MCLEOD: He looked at the boards in the box but he couldn't see anything. What can be in the box, wondered Clancy. He could see the hayloft (?) him.

RESPONSE: HE COULD SEE THE HAYLOFT RIGHT HERE.

MISS MCLEOD: Right here him? -- Maybe there is something up there I can use to open the box, thought Clancy. He walked (?) the barn door.

RESPONSE: HE WALKED TO THE BARN DOOR.

MISS MCLEOD: And climbed up the ladder to the hayloft, but then his troubles started. The farmer came and took the ladder away. Poor Clancy. How can he get down? He could see the pond, the trees, and the cows -- something -- him?

RESPONSE: DOWN.

MISS MCLEOD: It looked so far down. He saw the bridge (?) the pond. Where did he see the bridge? -- Tell me where.

RESPONSE: OVER THE POND.

MISS MCLEOD: He saw Mr. Rooster sitting--

RESPONSE: ON THE FENCE.

MISS MCLEOD: "Please help me get down," called Clancy. Mr. Rooster looked around the farm and he saw a rope (?) the machine shed.

RESPONSE: UNDER THE TRACTOR.

MISS MCLEOD: Under the tractor -- something -- the machine shed. The rope was (?) the machine shed. Where?

RESPONSE: ?

MISS MCLEOD: Near the machine shed. He picked up the rope with his beak and flew back to the haystack. Several animals were standing in front of the barn watching and told Clancy to throw one end of the rope down. They tied it on to the haystack and pulled the rope --

RESPONSE: UP.

MISS MCLEOD: "Get on the haystack and we'll lower you down," called the rooster. As Clancy came down the animals cheered, and then Clancy saw the farmer open the box. Inside was a baby--

RESPONSE: ?

MISS MCLEOD: And now Clancy's curiosity was satisfied.

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